MicroTerm 1.4 - Model I/III Intelligent Terminal
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User's manual [Rev C]
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Acknowledgements

Program authors :	Steve Pagliarulo
	Todd Tolhurst
Manual authors :	Mark Lautenschlager
	Karl Meyer

If you have problems or questions concerning your MicroTerm program, please contact :

Micro-Systems Software Inc.
Technical Support Division
4301-18 Oak Circle
Boca Raton, FL 33431
(305) 983-3390
MicroNet : 70271,120

We hope that you enjoy your MicroTerm and find it to be a useful addition to your software library. MicroTerm now exists in both 8 and 16 bit versions for many popular microcomputers and DOS'. Please contact us for a list of supported machines.

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In order to initiate the limited warranty, please fill out and return the enclosed registration card at once. This card entitles you to technical support, a limited free subscription to the Micro-Systems Newsletter, and puts you in line for all upgrades and error fixes. Please return the card just as soon as possible.

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Foreword
Mark R. Lautenschlager

What is MicroTerm? MicroTerm is more than just a terminal program for any particular computer. MicroTerm is a terminal package. We have written this program with two goals in mind.

First, to provide the user with all of the features that they expect in an intelligent terminal program. The capture buffers, translation tables, MacroKeys, etc.

The second goal was to write the program such that it can be easily converted to any micro and any DOS environment. MicroTerm will be showing up in as many places as there are computers to hold it.

MicroTerm includes all of the support utilities that you should ever need for your telecommunicating. With FILECONV and XFER, you can upload and download files from almost any service or transmit files between two XFER equipped computers with full error checking.

The idea of MicroTerm operating on so many computers is to allow you to have the same terminal software on all of your micros. Whether it is for the high speed data transfer support, the features, the documentation, the support, or the modest retail price, you cannot go wrong with MicroTerm.

Thanks to all of our Beta testers and to those who have contributed suggestions. Enjoy!

Introduction

Congratulations on selecting MicroTerm, a truly intelligent microcomputer terminal package! Whether you are a newcomer to microcomputer communications or an seasoned user, this manual will acquaint you with the smartest, fastest, and easiest to use terminal program available today. MicroTerm has many features that are unique, and designed to make communicating with a host computer simple, efficient and powerful.

MicroTerm Features

* "No-miss" operation. MicroTerm allows you to exit the Terminal Mode, return to the Command Menu, execute certain commands, and return to the terminal mode without missing a character! When you return to the Terminal Mode your screen will be updated at a high rate of speed.
* Certified 4800 baud operation. MicroTerm will operate correctly at input speeds up to 4800 baud without requiring null characters transmitted between valid characters. Under certain circumstances, MicroTerm may operate at speeds up to 9600 baud.
* MicroTerm allows you to execute a DOS command and return to the Command Menu without having to exit the program.
* MicroTerm's Auto Dial and Automatic Transmission Time features allow you to transmit files to a remote computer at any hour of the day or night totally automatically, without the need of an operator in attendance!

In addition, two utility programs are included with MicroTerm as part of this package:

* XFER/CMD, a direct file transfer program, gives you the ability to transfer files directly between two stations without having to convert them to hexadecimal format first. Thus, binary and ASCII files can be transferred between two systems having this program.
* FILECONV/CMD is a program that converts files from binary to hexadecimal for transfer to systems able to receive ASCII only. It will also convert hexadecimal files to binary.

There are two distinct levels of operation with MicroTerm:

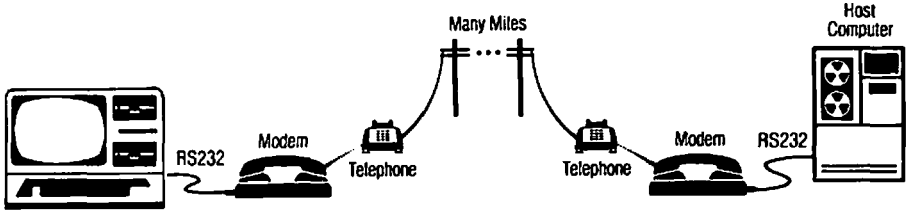
(1) The Terminal Mode
(2) The Command Mode

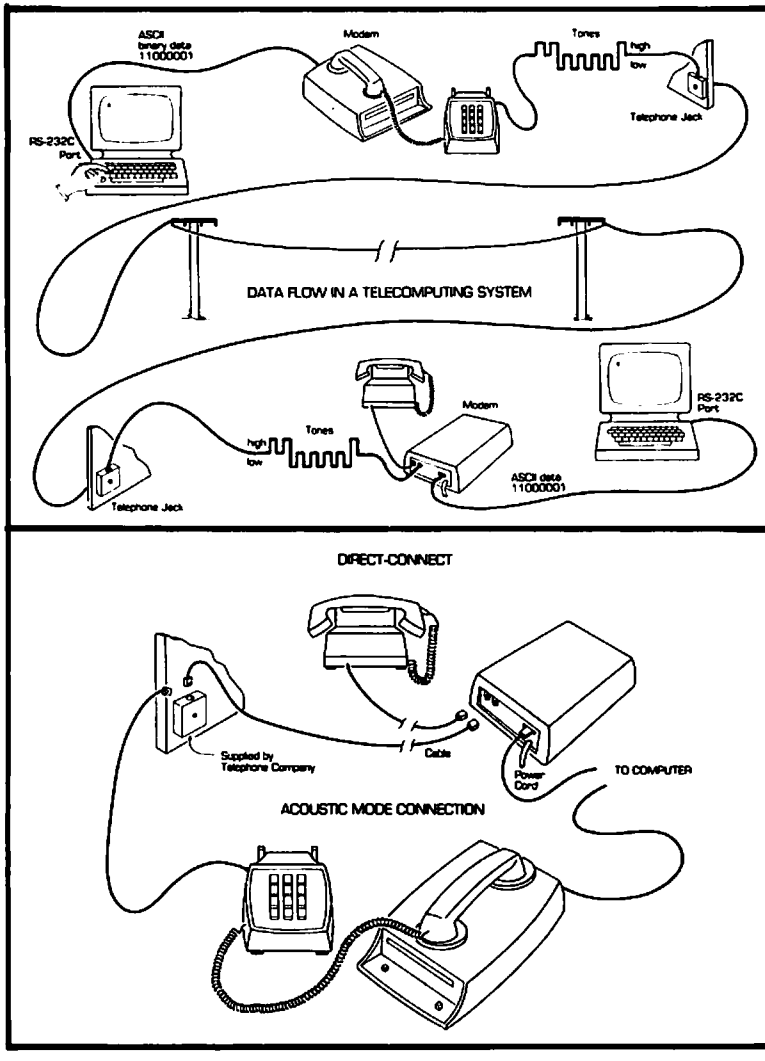
We will cover each in turn. Please read the following section entitled "Getting Started" before you begin operating the program for the first time. If you are new to the field of data communications and have never operated a terminal program, be sure to read the following two sections first. If you are already familiar with some other terminal program, make a backup diskette and proceed to Part III, MicroTerm Operations.

Part IV is the MicroTerm Technical Manual, and contains information which is invaluable to the experienced programmer, but of limited use to the average owner. Part V is the TDOS Manual, and contains information on the DOSPLUS Kernel System, a limited disk operating system which is provided with MicroTerm. Part VI is a glossary which contains terms with which you might not be familiar as you begin using your microcomputer as a communications terminal.

What You Will Need

1. Your TRS-80 Microcomputer with one or more disk drives.
2. RS232C Interface.
3. A direct connect modem or acoustic coupler.
4. A standard telephone.
5. MicroTerm.




ASCII
binary data
11000001
Modem
Tones
high
low
Telephone Jack
RS-232C
Port
DATA FLOW IN A TELECOMPUTING SYSTEM
Modem
Tones
high
low
RS-232C
Port
Telephone Jack
ASCII data
11000001
DIRECT-CONNECT
Supplied by
Telephone Company
Cable
Power
Cord
TO COMPUTER
ACOUSTIC MODE CONNECTION

ONE

Getting Started

Before doing anything else, review the Owner's Manual that came with your computer to make sure you are thoroughly familiar with its operation. Section V of this manual is the TDOS Manual, and contains full documantation for the TDOS Kernel System.

MicroTerm comes complete with TDOS, the kernel of DOSPLUS, the most powerful and simplest disk operating system available. All you need to do to begin the program is place the MicroTerm diskette in drive 0 and press the <RESET> button.

The screen will clear, the drive will run, and the following header will appear (if you are using a Model I, the model no. will be different, of course):

DOSPLUS - MODEL III KERNEL SYSTEM - 3.4 xxK
Copyright (c) 1981, Micro-Systems Software Inc.

DOS PLUS

You are now at the "DOS command level". If you have not yet made a backup of your MicroTerm diskette, you should do so at this point.

Making a backup

To make a backup of the MicroTerm master diskette, type BACKUP and press <ENTER>. The screen will clear and the following will be displayed:

DOSPLUS - Model I (or III) BACKUP utility - 3.4.1
Copyright (c) 1981, Micro-Systems Software Inc.

Source drive number ?

Reply by pressing <0> (the number "0", not the letter "O"). You will then be asked :

Destination drive number ?

Reply with the number of the drive that contains the diskette you wish to use for the backup. You will then see the following prompt:

Backup date (MM/DD/YY) ?

Answer with today's date. If the diskette was completely blank, BACKUP will begin the backup, formatting the destination disk first. Otherwise, you will see :

Diskette contains data, use or not ?

Answer by pressing <Y> or <U> (Yes, or Use) if you want to use the disk. Otherwise, press <N> (No) to abort the backup. If you wish to re-format the destination disk first, reply by pressing <F> (Format).

Remember, this is your last warning that the diskette you are about to copy onto contains data. If you thought it was blank, you should review your backup procedures carefully to make certain you do not destroy a diskette that contains valuable information.

Once you have responded to this question, BACKUP will go into operation. When the backup is complete, you will see the flashing message :

Insert SYSTEM disk (ENTER)

Make certain that the MicroTerm diskette is in drive 0 (because it contains the operating system) and then press <ENTER>. You will see the "DOS PLUS" prompt displayed on the screen signalling a successful backup. As a precaution, file your master diskette away in a safe place and use your backup from now on.

If you have a regular DOSPLUS, you will probably want to transfer MicroTerm to it for the availability of the complete set of library commands. Make sure that you transfer the file MTERM/DAT with MTERM/CMD, because if you power up without the MTERM/DAT file, the system will abort to DOS.

Technical Note:

Moving MicroTerm from TDOS to any operating system other than DOSPLUS is not recommended. Certain features of MicroTerm, such as the upper/lower case conversions, are dependant upon the DOSPLUS drivers they use. If you attempt to use MicroTerm on another system, results could be totally unpredictable.

Notice to Model I Owners

Model I MicroTerm is not capable of the same extremely high speed operation as the Model III version. Because of the way the interrupts are fashioned on the Model I as opposed to the Model III, the maximum certified speed of operation for MicroTerm on the Model I (with no nulls inserted) is 600 baud. You may still, however, return to the main menu and continue to input characters as long as you remain at 300 baud.

TWO

Using MicroTerm
(Instructions for Beginners)

If you have never used a terminal program before, study this section carefully before going any further. After a short period of getting acquainted with MicroTerm, you will find yourself thinking about your communications rather than what to do with the program. If you encounter terms you don't understand, refer to the glossary (Section VI).

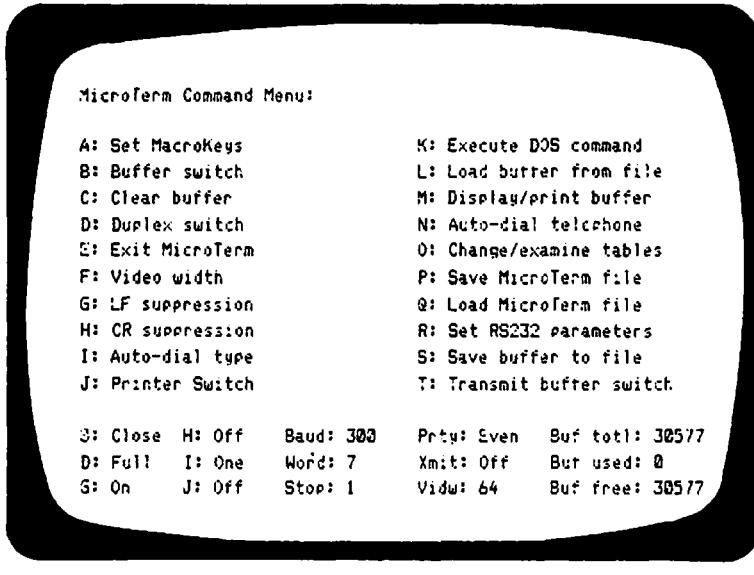
Throughout this manual the terms "press," "type," and "enter" will be used to indicate different actions. Press means that a stroke of a key is required (normal, control or shifted). Type is used when a series of keystrokes is indicated. Enter is used when a series of keystrokes is terminated. Individual keystrokes are indicated with < > surrounding them: <P>, <CLEAR>, etc.

Entering the Terminal Mode

With your MicroTerm diskette in Drive 0, type MTERM and press <ENTER>. The screen will clear and the following header will be displayed:

MicroTerm - Model III Terminal Utility
Copyright (c) 1982, Micro-Systems Software Inc.
Version 1.4 - Created 10/13/82

Your system is now in the Terminal Mode. The Terminal Mode is where you will spend most of your time doing your actual communicating. Now press the <CLEAR> key, and MicroTerm will enter the Command Mode, displaying the Command Menu, shown on this page. Take a few moments to study the setup of this menu.


MicroTerm Command Menu:
A: Set MacroKeys
B: Buffer switch
C: Clear buffer
D: Duplex switch
E: Exit MicroTerm
F: Video width
G: LF suppression
H: CR suppression
I: Auto-dial type
J: Printer Switch
K: Execute DOS command
L: Load buffer from file
M: Display/print buffer
N: Auto-dial telephone
O: Change/examine tables
P: Save MicroTerm file
Q: Load MicroTerm file
R: Set RS232 parameters
S: Save buffer to file
T: Transmit buffer switch
C: Close H: Off Baud: 300 Prty: Even Buf totl: 30577
D: Full I: One Word: 7 Xmit: Off Buf used: 0
G: On J: Off Stop: 1 Vidw: 64 Buf free: 30577

Notice the defaults (values supplied by the system). Before going any further, try pressing any of the keys corresponding to the first letter in the first column of the Command Menu. CAUTION! Do NOT press <P> after making any changes in the Command Menu. Doing so would result in changing the defaults if you give it a filename!

If you should press a key that results in the bottom area of the Command Menu clearing and displaying a prompt line asking you for anything you do not understand, press <BREAK> to escape and return to the Command Menu.

Watch the table at the foot of the screen reflect the changes as you try different Command Keys. Don't worry about upsetting anything here; you can come back to these default values simply by pressing <E> and returning to DOSPLUS (if you have not saved any changes with the "P: Save MicroTerm file" Command. If you have done so, they must be returned to the values as shown on the table above).

From the DOSPLUS command level, return to MicroTerm's Terminal Mode by typing MTERM and pressing <ENTER>. The program will be reset to its original values.

To switch back and forth between the Terminal and Command Modes, simply press <CLEAR> or <SHIFT> <CLEAR>. While in the Command Mode, set your system to Half Duplex by pressing <D>. Look at the display area at the bottom of the Command Menu. Each time you press <D> the status indicator switches from "Full" to "Half" or from "Half" to "Full." Half Duplex sends the characters you type immediately to your screen; Full Duplex sends them through the modem to the system at the other end of the telephone line, where they are returned to your system, which then displays them on your screen. This is the most common method of transmitting, for it enables you to check what has been received at the other end.

Because you will need to see how MicroTerm handles the keyboard and some special functions, Half Duplex will allow you to do this without being connected to another computer. Once in Half Duplex, press <CLEAR> and return to the Terminal Mode.

The MicroTerm Keyboard

MicroTerm has its own special keyboard driver. This provides several special characters and Function Keys while in the Terminal Mode. They are:

Key	Function
Clear	Goes to Command Menu
Shift Clear	Goes to Command Menu
Down Arrow	MicroTerm Control key
Shift Down Arrow	Function Key

The Control Key allows you to send the "control" characters of the ASCII set (Ctl-A through Ctl-Z). To transmit a control character, press the Control Key and while holding it down, press the desired character.

In addition to the 26 standard control characters, MicroTerm provides several special characters that do not appear on the keyboard by use of the MicroTerm Control Key. This feature allows you to make use of the full ASCII character set, not just the portions that appear on the standard keyboard. Try them now.

Key	Produces:	
6	Carat	(^)
7	Tilde	(~)
8	Left Bracket	([ )
9	Right Bracket	( ])
0	Vertical Bar	(|)
<	Left Brace	({)
>	Right Brace	(})
/	Backslash	(\ )

Later you will see how to change these by means of the keyboard table if you desire some other arrangement.

MicroTerm also provides you with 10 Macro Keys, which are capable of being programmed to hold up to 64 keystrokes each. All are executed by using the Function Key and a number from 0 to 9. Simply by holding the Function Key and pressing a number, the following sequence could be sent:

John W. Everyman
Newark Rep. # 123-4
Great Guns Armaments

including the carriage returns. Pages 21 to 23 contain complete instructions on programming and using Macro Keys.

With MicroTerm you can transmit a true <BREAK> by using the combination <Shift> and <BREAK>. While most systems filter out a Break upon receiving one, this feature makes it possible to transmit a Break if the system on the other end should require it for any reason.

Another convenient feature is the Screen Print. By holding down <Shift> and pressing <Right Arrow>, whatever is on your screen will be sent to the printer for hard copy. You might want to try this now by printing a copy of the Command Menu. (Be sure your printer is properly connected and turned on, and that the On Line Switch, if any, is set to the On Line position.)

When using MicroTerm, bear in mind that you also have these standard keyboard features :

* Repeating keys. Simply hold down the desired key. After approximately 1/2 second, it will begin to repeat until you release it.

* Upper/lower case switch. You have two modes of type, lower case with <SHIFT> upper case (also known as the "typewriter mode"), and upper case with <SHIFT> lower case. The program powers up in the standard typewriter mode.

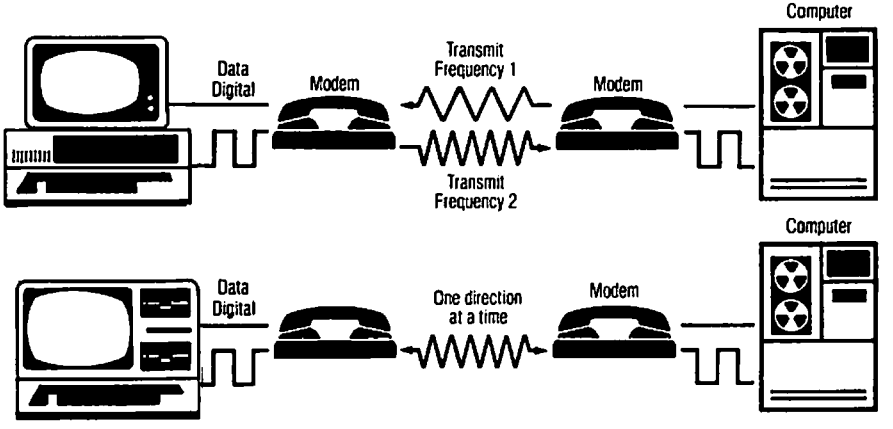
After you have experimented with the different Command Keys and feel comfortable with their funtions, you should be ready to try communicating with a local Bulletin Board Service if you have one in your community. (In the following pages, we'll examine each of the options on the Command Menu in detail.) You should have enough information about MicroTerm at this point to be ready to start work. For the following exercise, we'll assume you are using an acoustic coupler, and want to communicate with a local BBS.

If you have changed any of the default settings in the Command Menu and aren't certain you have reset them correctly (again, refer to the illustration of the menu in this section), exit the program by pressing <E> in the Command Mode and return to the DOSPLUS level. Type MTERM and press <ENTER> to return to MicroTerm with the preset defaults.

Simply use the default values as they are supplied with MicroTerm. Once you are in the Terminal Mode, make connection with the telephone of the service you desire, and when you hear the carrier (a high-pitched squeal), push the handset into the rubber cups. As soon as your terminal is recognized by the host computer, communications are underway. Typically, you will be asked for your name or some identifying number, and the host will wait for you to type in your response. Once you have been "logged in" you select something from a menu of options. When you are finished, follow the prompts to log off. Do not simply hang up the phone, as some systems will permit you to do this only a limited number of times before denying you access.

If you will be logging onto a timesharing system that charges so much for each minute of "connect time," it would be wise to experiment with a local, free BBS until you are thoroughly familiar with terminal operations. Because some systems have rates running as high as $42.00 an hour, your early education could be quite costly!

Even though you purchased MicroTerm primarily for business purposes, you will find a wealth of information on many local BBS's, which are proliferating in all parts of the country. Most of them are free, public services where you may send and receive messages, and frequently these systems have provisions to provide confidential messages which can be accessed and read only by the person to whom it is addressed. Some are for special interest groups, some are accessible only to paid subscribers, and others have been set up as public service boards which provide news and weather information, or local agricultural market prices. These systems usually do not allow leaving any messages, but are for dissemination of information only. To find out what services are available in your community, check with your local computer vendors.



THREE

MicroTerm Operations

Insert a backup copy of your MicroTerm diskette into Drive 0 and press RESET to boot the system. Load MicroTerm at the DOS Ready level by entering MTERM. (You might want to use the AUTO feature to do this automatically upon bootup.) Your screen will display the following:

MicroTerm - Model III (or I) Terminal Utility
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Version 1.4 - Created 10/13/82

MicroTerm has two levels of operation:

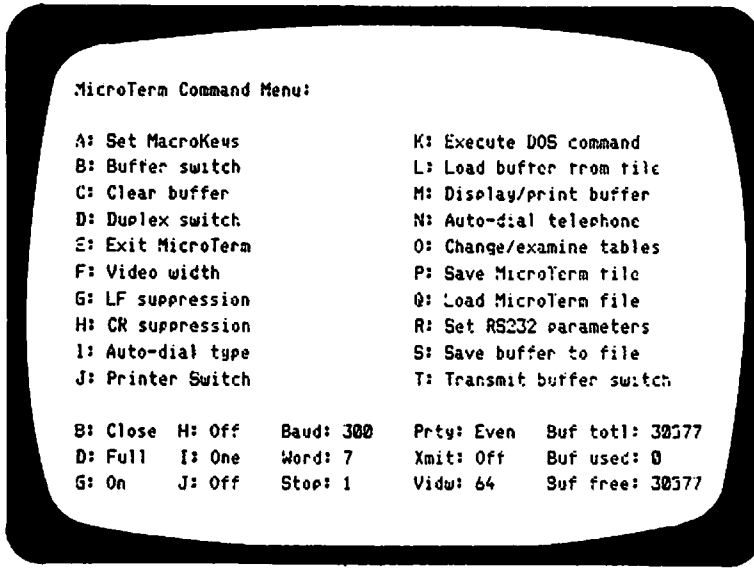
(1) The Terminal Mode
(2) The Command Mode

When you power up, your system is in Terminal Mode. Pressing <CLEAR> or <SHIFT> <CLEAR> switches you between the two modes. Go to the Command Mode and study the Command Menu.

The Command Menu consists of two parts, the Options Table and the Status Table. The Options Table contains 20 selections (A-T). The Status Table displays the current status of 12 selectable configurations for your system, plus information on the buffer.

The Command Mode

You enter the MicroTerm Command Mode by pressing <CLEAR> while in the Terminal Mode. When you press that key, the following menu will be displayed:


MicroTerm Command Menu:
A: Set MacroKeys
B: Buffer switch
C: Clear buffer
D: Duplex switch
E: Exit MicroTerm
F: Video width
G: LF suppression
H: CR suppression
I: Auto-dial type
J: Printer Switch
K: Execute DOS command
L: Load buffer from file
M: Display/print buffer
N: Auto-dial telephone
O: Change/examine tables
P: Save MicroTerm file
Q: Load MicroTerm file
R: Set RS232 parameters
S: Save buffer to file
T: Transmit buffer switch
B: Close H: Off Baud: 300 Prty: Even Buf totl: 30377
D: Full I: One Word: 7 Xmit: Off Buf used: 0
G: On J: Off Stop: 1 Vidw: 64 Buf free: 30377

The bottom three lines of the menu display the status of your buffer (Open or Closed), the current duplex mode (Half or Full), the printer (On or Off), and certain other information. All of these will be covered, but those used most frequently are the ones showing you the status of your buffer and printer.

The three items on the right show you how much total space you have in your buffer, which is the available memory in your system after MicroTerm is resident in RAM; how much of this memory you have used; and how much free space you have remaining. A full discussion of the buffer and its use will follow later.

The settings displayed in the example above are the defaults, that is, the values included in the file "MTERM/DAT". When you change any of these settings to be your normal defaults, simply save them to the disk using the <P>, "Save MicroTerm settings" command.

If you wish to use alternate settings for special applications, simply set them as you desire, then save those settings under a different filename. You might want different settings for each of several bulletin boards you work regularly, other settings for CompuServe, and still others for communicating with a host system within your own business. Once you have saved each configuration under its own filename, you may load it when loading MicroTerm by specifying that filename after the MicroTerm program name. For example, if you configure MicroTerm to transfer data between a Model III and a Model II, you would set certain parameters (like a high baud rate) that would be used each time this application is desired.

When you want to use MicroTerm this way, simply load the program and data file by entering MTERM followed by a space and the name of the file. Here are several examples: MTERM TRANS/M2, MTERM BBS, MTERM COMPSRV. Microterm would then load its default values from the "TRANS/M2" file, the "BBS" file, or the "COMPSRV" file, eliminating the necessity of your having to change them every time you wanted to use them. The number of data files you may have is limited only by your available disk space.

To execute one of the menu options, all you do is press the key corresponding with the letter that appears to the immediate left of the desired command. There are several types of commands:

(1) Switch Commands

* These commands are either "on" or "off". When you press the key to alter these commands the status area of the menu will change with no other visible effect.

(2) Immediate Action Commands

* These commands are used to begin a particular action. They will not necessarily cause any immediate display change.

(3) Parameter Commands

* These commands allow you to change a parameter that requires operator definition. After selecting one of these, they will prompt you for further data.

(4) Extended Commands

* These commands involve altering data complicated or copious enough to require a seperate menu. Pressing the key for one of these commands will call up the necessary sub-menus.

While you are at the Command Menu, incoming data is being stored in a Temporary Capture Area. It will not be displayed on the screen until you return to the Terminal Mode. At that time the screen will be updated at a high rate of speed until you are caught up. Also, if the buffer is open or the printer is on, the data will be sent to those devices after returning to the terminal mode. While in the menu, everything is on "hold" (so to speak). There is a limit to the length of the hold, however.

The Temporary Capture Area is about 1K bytes in size, and if it becomes full while you are in the Command Mode all subsequent characters will be lost. When communicating at 300 baud, you will have about 30 seconds; at higher baud rates, however, you must limit your time in the Command Mode to avoid overflowing this area. At 4800 baud you have less than two seconds to leave the Terminal Mode, change a setting, then get back to the Terminal Mode!

You return to the Terminal Mode by pressing either <BREAK> or <CLEAR>.

Now let's examine each command in turn.

A: Set MacroKeys

MicroTerm features 10 user-defined "MacroKeys." A MacroKey is a string of 1 to 64 characters that may be transmitted automatically upon receipt of an ASCII 05 (ENQ) signal, or manually by pressing The Function Key (<Shift> <Down Arrow>) and typing any numeral 0 to 9 simultaneously. MacroKey 0 is transmitted upon receipt of the ENQ signal, and functions as an Auto Logon Message. Semicolons (;) are used in place of carriage returns, and the apostrophe (') will provide a delay of about 1 second. The ampersand (&) may be used in the definition of a MacroKey to link one MacroKey with another. For example, if you define a MacroKey as follows,

John Q. Public;"Boca Raton, FL;&1

the name "John Q. Public" would be transmitted, followed by a carriage return and a pause of approximately 2 seconds; the city name "Boca Raton, FL" would then be transmitted, followed by a carriage return. Finally, the "&1" then links this MacroKey to MacroKey #1, and the contents of MacroKey #1 are transmitted.

The MacroKeys provide a powerful addition to your terminal, and are limited only by your imagination. As time savers, they can eliminate the necessity for repeating a sequence of keystrokes if the same information is to be included in numerous messages. As an example, if a territorial sales representative makes a daily report to his home office, he could program two of the MacroKeys this way:

Sam Jones;'Manhattan Dist. #17;'Widget Div.;&5
Daily Sales and Activity Report for

and the following would be transmitted:

Sam Jones
Manhattan Dist. #17
Widget Div.
Daily Sales and Activity Report for

The cursor will be positioned correctly to fill in the date. Four lines of text have been transmitted by pressing one Function Key.

By using multiple data files, there is no limit to the number of MacroKeys that may be defined and readily available. This will be discussed under <P> and <Q>, saving and loading Microterm files.

B: Buffer Switch

With this command, you may open and close the Capture Buffer at will. The Capture Buffer is used for storing data as it comes in the RS232C and then manipulating it later. It is also used to upload and download programs or any ASCII files. (We shall refer to it simply as the buffer after this.)

The buffer is defined as that area of memory between the end of the MicroTerm program and whatever address the HIMEM pointer indicates. This allows you to have special drivers resident in high memory if you like; you must simply have them adjust that point to protect the area where they reside. It also allows the buffer to be self adjusting relative to the amount of RAM in your machine.

This is a Switch command. When you press the <B> key, the status display to the right of the "Open" or "Close". Whatever the current status, it will be reversed when <B> is pressed.

The three items in the lower right hand side of the display show the total size of the buffer, the amount of data currently in the buffer, and the amount of free space remaining.

To have a remote device open and close the buffer for you automatically the following procedure is used. If a control-R (ASCII 12H) is received, the buffer will be opened under program control. If a control-T (ASCII 14H) is received, the buffer will be closed under program control. These control codes are sent automatically by most bulletin boards and communication services when downloading programs. It would not be necessary for you to open and close the buffer manually in these cases.

When a control-R is received, the message "*** Buffer open ***" will be displayed. When a control-T is received, the message "*** Buffer closed ***" will be displayed. When the buffer is full, the error message "*** Buffer full ***" will be printed, and the buffer will be closed, and any data received after this will be lost.

It is important to note that the buffer is not cleared automatically every time it is opened. Because of this, you may input several segments of data from a remote source and save them as one file here. It also means that if you want to input new data into a "clean" buffer, you must clear the buffer manually first.

C: Clear Buffer

This command will clear the buffer of any current data.

This is an Immediate Action command. The moment you press <C>, the command is executed. The "Buffer used:" counter will reset to "0" when this command is used.

Once the buffer is cleared, the data stored in it is gone, and you will have no way of retrieving it. Therefore, if you desire to save any current data in the buffer, make certain you save it to a disk file or to the printer prior to clearing the buffer in preparation of receiving new data.

Using this command will not affect the buffer open/closed status. If the buffer is open when you clear it, it will remain open.

D: Duplex Switch

This command allows you to switch back and forth between "Full" and "Half" duplex.

The method by which most communication services operate is called "Full duplex". This means that when you transmit a character, it is not immediately displayed on your screen. It is transmitted to the remote computer, processed by it, and echoed back to you. At that point the character will be displayed on your screen. This is the preferred method because if a transmission error should occur, you will see the character displayed incorrectly on your screen.

Operating in "Half duplex", the character sent is immediately displayed on your screen as it is transmitted. This is used when the remote end is not going to echo your characters back to you. You must assume that the transmission was correct.

This is a Switch command. When you press <D>, the status display on the bottom of the menu will change. It will switch between "Full" and "Half".

The rule to follow in selecting Full Duplex or Half Duplex is, adjust your MicroTerm to whatever the remote system is using. If it is in Full Duplex and you want to talk to them, use Full Duplex; the same is true for Half Duplex. The ability to configure MicroTerm makes it possible for you to communicate with either.

E: Exit MicroTerm

This command will return you to DOSPLUS. It is an Immediate Action command. As soon as you press <E> from the Command menu, the screen will clear and the prompt "DOS PLUS" will be displayed.

Before you exit MicroTerm and return to DOSPLUS, make certain you have saved any changes you have made, such as telephone numbers or the MacroKeys, with the "Save MicroTerm settings" command.

F: Video width

This command is the first part of MicroTerm's screen re-formatting capability. It allows you the option of defining where to terminate a line to prevent the splitting of words.

One of the difficulties encountered in using your computer to communicate with a wide variety of different computer systems is that few of them will be using screens like yours. Most will be using the standard 80 character screen; some will use 40 characters; still others use a 32 character wide screen. With MicroTerm, you may re-format the screen locally to the full width of your screen to provide a neat, even display.

The way the screen re-formatting procedure works is simple. You set the video width parameter to equal a certain value. Whenever MicroTerm receives a space after it reaches that point on the line, it will translate the space into a carriage return, forcing the next word down to the new line. If no space arrives before the end of the line is reached, MicroTerm will split the word.

If you are going to make use of the screen re-formatting, you should set the line length to be short enough to allow for most average words to finish without splitting. A value of 54 or 56 can be convenient with a 64-character screen. Then, anytime a space is received after the 54th or 56th character, it will be translated into a carriage return.

This is a Parameter Command. When you press <F>, the bottom of the Command Menu will clear with the exception of the prompt:

F: Video width:

Now enter any desired width between 1 and 99. A value greater than 64 effectively disables the screen re-formatting.

The default value is 64 or no re-formatting. It lets the words break where they may. If the BBS or communication service you are working with is set up for TRS-80s or if it has the ability to re-format for any size screen, then you will not need to use this parameter.

Please note that when you use the screen re-formatting, you should also turn on the carriage return suppression. This places the formatting of the text entirely in MicroTerm's control.

G: LF suppression

This command will configure MicroTerm to ignore any incoming single linefeeds.

Most computer systems operate with the ASCII standard codes, which was originally designed for teletypes. Because of this, they output information for teletype style terminals. Teletypes are not known to be remarkably intelligent; they require two codes at the end of every line.

A teletype must receive a carriage return to indicate end of line and send the print head to the beginning of the line. Next they require a line feed to advance the paper one line. Most computers, however, need only one code to do both functions.

The way both the TRS-80 Model I and the Model III video drivers were written, either code will work. However, if both codes are received, then you will receive an extra line feed on your display (or printout).

This is a Switch Command. When you press <G>, the status display on the bottom line of the Command Menu will change. It will switch between "On" and "Off".

The greater percentage of communication services will still transmit a line feed after every carriage return, however, in case you are using a terminal or printer that requires it. Many non-teletype video terminals today still act like teletypes, which is one reason they are called dumb terminals. MicroTerm's line feed suppression allows you to ignore that trailing line feed and accept only the carriage return, which is really the standard for most microcomputers.

If two or more line feeds are received, only the first will be ignored, so if a particular service sends you a stream of line feeds to act as a "clear screen" or a "top of form", it will still work. If this function is turned off, then all line feeds received will be displayed.

This function will be required with almost all applications. The default value is "On", and this is normally be the case; it is the method most commonly used.

H: CR suppression

This command is the second part of MicroTerm's screen re-formatting capability. It allows you the option of ignoring carriage returns transmitted from the remote system and allowing the text to be formatted locally by MicroTerm.

If, for example, the system transmitting to you should send 80 column lines and you want to make them appear normal on your 64 column screen, you would first set the video width parameter to prevent words from being split at the end of the lines. After the screen re-formatting command begins sending incoming characters down to the next line, the remote system decides several characters later that it is done with that line and sends a carriage return of its own. Normally the line then being displayed would be terminated.

If, however, the carriage return from the remote system is ignored, you will have an even, formatted screen filled with text. That is the purpose of suppressing carriage returns.

This is a Switch Command. When you press <H>, the status display on the bottom of the Command Menu will change. It will switch between "On" and "Off".

When this function is engaged, any carriage returns coming in the RS232C from the remote computer will be translated into spaces. If two or more carriage returns are received, only the first will be translated into a space, so that if a remote station is attempting a "clear screen" or a "top of form" by sending you a stream of carriage returns, your screen will be cleared anyway.

This function will also re-format narrow text to a wider screen. There is a drawback, however. This re-formatting will be of use only when dealing with large blocks of text. Menus and tables will no longer be neat and tidy when re-formatted without carriage returns. Therefore, you are urged to use discretion when you decide to reformat.

If you are going to do any text re-formatting, you will need both the carriage return suppression and the video width parameters. Neither one is much good without the other. Because a great many of the systems you will be communicating with are probably either designed to work with TRS-80s or have the ability to configure for just about any video width, this parameter is turned off by default.

In brief, MicroTerm does no screen re-formatting by default. For the most part, this will be quite satisfactory; However, if you should need it, MicroTerm gives you the ability to change it to suit your desires.

I: Auto-dial type

This command allows you to configure MicroTerm to work with the auto-dial feature of most of the major auto-dial modems on the market.

Each modem has its own characteristics. We have configured MicroTerm to work with the following:

(1) Hayes Smartmodem
(2) Radio Shack Modem II
(3) The Lynx
The Microconnection
Signalman MKVII
(4) Undefined

(The Lynx, The Microconnection, and The Signalman MKVII all use the same setting on MicroTerm. The fourth setting has been left undefined at this time, and is reserved for future use.)

This is a Switch Command. As you press <I>, the status display at the bottom of the Command Menu will change to reflect the number of the type currently selected.

Each modem has its own particular characteristics. If you have an auto-dial modem other than one of the brands listed above and want to know if MicroTerm will work with it, contact Micro-Systems Technical support. Certain modems dial exactly like certain other ones; you can probably dial yours by selecting one of those already included.

At this point, you need not be concerned with anything except the type of modem you have. The telephone numbers are stored elsewhere and the type of dialing (touch-tone or pulse) is controlled at the time of dialing. (Some modems are auto-dial, but still do not support touch-tone dialing.)

J: Printer Switch

This command allows you to activate MicroTerm's Screen Printer routine. When this function is engaged, MicroTerm will duplicate every character sent to the screen to the line printer also.

This is a Switch Command. When you press <J>, the status display on the bottom of the Command Menu will switch between "On" and "Off".

The printer is "spooled" in MicroTerm. This means that if data is being received at a rate higher than the printer is capable of working, the data is stored in a buffer until the printer can handle it. Most printers can handle the normal 300 baud rate with no difficulty, since that works out to about 33 c.p.s. (characters per second). However, if you have a daisy wheel printer working at 13 or 25 c.p.s., or a converted typewriter that puts out a sluggish 8 to 10 c.p.s., it is obvious that the input to your system is going to run ahead of the output of your printer.

With MicroTerm's spooling feature, the output of the printer can fall behind that of the screen, but no data will be lost and you will be able to work normally without having to wait for the printer.

The printer buffer is approximately 1500 bytes. If this buffer becomes full, the error message "*** Printer off ***" will be displayed and the printer will turn itself off. At that point, no more characters will be printed. Therefore, if you input data at a very high rate of speed from a communication service and you want hardcopy, you'd better have a fast printer. Lacking a true high speed printer, in order not to lose data, you should open the buffer and later print the contents of the buffer from the "View buffer" command.

This function is used primarily when working at 300 baud to provide hardcopy of a particular message of interest, or the entire session, if desired. This is where the printer translation table comes in. We will discuss the translation tables in detail later For now you should know what could happen if your printer doesn't "speak the same language" as your video display.

Certain control codes will have rather dramatic and undesirable effects on your printer. Needless to say, this can become a problem.

With the printer translation table, you may filter out any video control codes that are not consistent with your particular printer. Simply use the "Change/examine tables" command (see page 41) to review the printer table and set any offending code equal to "00". This will inhibit MicroTerm from transmitting that code to your printer.

K: Execute DOS command

This feature is unique to MicroTerm. It allows you to execute a DOS command from the Command Menu and return to the menu without disturbing the program, and without any loss of incoming data (except as noted below), provided you return to the menu before the buffer overflows.

This is a Parameter Command. When you press <K>, the display area at the bottom of the command menu will clear with the exception of the prompt:

K: Enter DOS command:

At this point you may execute any valid DOS command. Remember that you are on TDOS, not DOSPLUS; not all of the standard DOSPLUS library commands are available to you. (For that reason alone, if you have a regular DOSPLUS, you would want to transfer MicroTerm to it.)

If the DOS command you enter requires operation of the the disk drives, during the period that DOSPLUS is operating the drives MicroTerm would miss any characters coming in the RS232C.

When using this feature of MicroTerm be careful not to use any utilities that would conflict with program memory such as BACKUP and FORMAT. An example of the use of this function is:

K: Enter DOS command: CAT :1 <ENTER>

This will display a file catalog for the disk in drive one. This would allow you to verify a filename before loading the buffer, or before saving it to disk, to prevent overwriting an existing file with the same name. You then return to the Command Menu by pressing <CLEAR> or <BREAK>.

L: Load Buffer from Disk

This command will allow you to fill the MicroTerm buffer with data from a specified disk file. This allows you to perform all needed functions (such as Binary to ASCII conversion) off line and later read them in so that you may transfer them to a remote station.

This is a Parameter Command. When you press <L>, the bottom of the Command Menu display will clear with the exception of the prompt :

L: Filespec:

At this point you should enter the name of the file you wish to transfer. The data contained in the file must be stored on the disk in ASCII. Information can only be transferred with any great degree of compatibility between systems if it is first in ASCII.

The filename must be a standard DOSPLUS file specification. No extensions will be assumed. If the file you are loading is too large for the buffer, the error message "*** Buffer full ***" will appear and the operation will be terminated. What you have in the buffer will be only part of the file. If another error is encountered, the error message will display and MicroTerm will wait for you to press a key before returning you to the menu.

If the load is successful, you will simply be returned to the Command Menu, and the "Buffer used:" display will be incremented to reflect the amount of data it contains.

Once the buffer is loaded, you may add more data from a second file by simply repeating the procedure. This command does not clear the buffer prior to beginning the load. This feature allows you to assemble several small text files into the buffer and transmit them at once.

M: View buffer

This command allows you to examine the contents of the buffer. This is an important feature of MicroTerm, because you can use it to verify the contents of the buffer after a download and before saving it to disk.

This is an Extended Command. When you press <K> from the command menu, the bottom of the display area will clear with the exception of the prompt:

M: Device (*DO or *PR):

Reply with a <D> for the screen or a <P> for the printer. (Simply pressing <ENTER> will display the buffer to the screen, since this is the default.) The listing will be transmitted to the selected device through the standard display and/or printer tables, allowing you to filter undesired codes. When it is finished, it will pause and wait for a key to be pressed. Then you will be returned to the command menu.

When you make your choice, the screen will clear and the listing will begin. If you selected the print option, it will list to both screen and printer. If the printer is not available, the program will "hang". You now have two choices. Turn on the printer (if you don't own a printer, MicroTerm will wait for you to buy one and install it), or abort the operation. You may abort by pressing either <Break> or <Clear>.

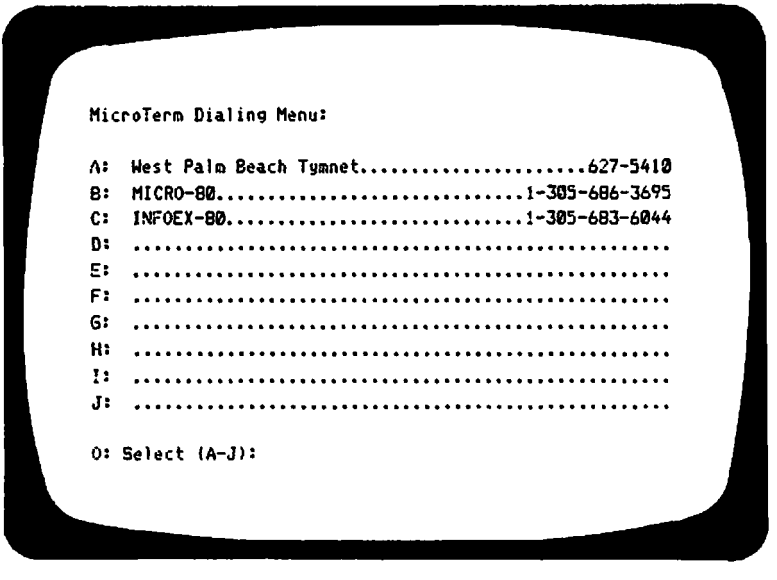
When examining the buffer, if you press the space bar, the display will freeze, allowing you to read it. To resume the display, press the space bar again. If you then press the <Break> or <Clear> key, you will return to the Command Menu.

Remember, this command will have no effect if the buffer is empty. It will simply ignore you. When you reach the end of the text in the buffer, the display will pause and wait for you to press any key before returning you to the Command Menu.

N: Dial telephone

This command allows your modem to dial the telephone. Before this command can be used, the "Autodial type" parameter must be adjusted to the modem you have. Refer to the <I> command (Autodial type) to be certain of compatibility. It is also necessary to have entered some phone numbers in this table by using the "Change/examine tables" command.

This is an Extended Command. When you press <N> from the Command Menu, the screen will clear and this table will be displayed:



At this point you have several options. First, you may simply press the letter of the number you wish to dial and press <ENTER>. It will dial this number and return you to the Terminal Mode to wait for the connection to be made with the remote computer. Second, you may enter a number manually if it does not appear on the list. You do this by simply typing the number you wish to dial and pressing <ENTER>.

All punctuation is ignored when MicroTerm evaluates a number for dialing. You may store the numbers with any variety of punctuation you wish and you may enter an alternate number the same way. All MicroTerm recognizes in a phone number like "1-(222)-333-4455" is "12223334455", ignoring everything but the numbers themselves. Since it is easier to read with all punctuation in its normal fashion, you may want to take advantage of this.

The Hayes Smartmodem and the Radio Shack Modem II have the ability to dial both pulse and touch tone. If your telephone system is capable of touch tone dialing, this is the faster method. If you cannot get touch tone phones in your area, then you will need to dial pulse.

With the Hayes, pulse is the default. If you want to force it to dial touch tone, place a "T" in front of the selection letter or the number you have typed in. This will force the Hayes to dial touch tone.

The Radio Shack Modem II works the same way. The default is pulse dialing; to force a touch tone dial, you must place a "T" in front of the selection letter or the number you have typed in.

With the Microconnection, the Signalman, and the Lynx, there is no provision for touch tone dialing. They will always dial pulse.

This routine will not transmit any invalid characters to the modem. For example, if you were to respond with "This is a test" when it asks you for a number, MicroTerm will scan through the input seeking valid numbers and, finding none, will return you to the Terminal Mode without dialing anything.

An example of using the auto-dial feature would be the following:

N: Select (A-J) or number: A <ENTER>

That will tell the modem to dial the number assigned to the "A" position.

Once MicroTerm "picks up the phone" to dial, it does not automatically disconnect. If there is no answer, or if anything occurs to prevent establishing a carrier signal, it will wait for 30 seconds, hang up the phone, and return you to the dialing menu. To return to the dialing menu before the 30 seconds are up, press <BREAK>.

If you should want to disconnect the phone manually, press <X> <ENTER> at the selection prompt.

O: Change/examine tables

This is perhaps the single most powerful command in MicroTerm. With this command you can:

* Alter any key on the keyboard to generate any value you desire when pressed.

* Change any code being sent to the display to any other code you might wish. This can be used as an effective video filter to prevent unwanted codes from destroying your video display.

* Change any code being output to the printer into any other code you desire. This can be used as a highly effective printer filter, getting rid of codes that would otherwise cause your printer to behave erratically.

With this command you may "de-code" special characters that mean something to other systems into the corresponding codes for your system. It allows you complete flexibility to translate between ASCII and any other code.

The TRS-80 uses what is called the ASCII character set. ASCII stands for the American Standard Code for Information Interchange. The ASCII code is the most widely used code in the world, but it is not the only one. For example, IBM uses the EBCDIC code. EBCDIC stands for Extended Binary Coded Decimal Interchange Code.

Because of the differences in these codes, if you wanted to communicate with an IBM computer, you would need to translate everything coming in the RS232C from EBCDIC to ASCII. This would be done via the display translation table (*DO). You would also need to translate everything going out the RS232C from ASCII to EBCDIC. This would be done via the keyboard translation table (*KI).

The vast majority of your communications will be done with systems that use ASCII, so it is highly unlikely that you will ever have to translate an entire code. You will be using the tables more to adjust for special hardware than anything else.

For example, an ASCII 17H will put the TRS-80 into the double wide character mode if displayed. Under most circumstances, this is highly undesirable. Therefore, in the display (*DO) table, we have translated a 17H into a 00. This prevents the 17H from being sent to the display and putting everything into the double-wide mode.

Undoubtedly the most common use will be to configure your output for the particular printer you use. The only thing that is "standard" about printers is that each one utilizes control codes in a different manner. For this reason, certain control codes that are sent to your terminal to manipulate the video display could cause your printer to exhibit signs of certifiable insanity.

For example, a control code that is displayed on your screen as the tilde (7E) might be interpeted by your printer as an instruction to begin underlining, or bold face. The problem becomes acute if your printer is not capable of producing underlining or bold face, and almost anything could happen.

To avoid such frustrations, you can block these codes or translate them into something useful by means of the printer translation table (*PR). For example, whenever the video screen is cleared, you could issue a "top of form" instruction to the printer.

To execute the command, press <O> from the Command Menu. The bottom of the display will clear with the exception of the prompt:

O: Which table (TE,KI,DO,PR,BI,BO,RI,RO):

At that point indicate which table you wish to work with. You may use these abbreviations :

<T> for phone numbers
<K> for keyboard
<D> for display
<P> for printer

The next four tables can be selected only by entering both letters:

<BI> for buffer input to the system
<BO> for buffer output from the system
<RI> for input from the RS232C
<RO> for output to the RS232C

Type in your choice and press <ENTER>. The screen will clear and you will be looking at the table that you have selected.

The phone number table

This table looks identical to the standard dialing menu. You will have the same prompt at the bottom of the table that you see when dialing:

O: Select (A-J):

Now, however, when you type in the letter of your choice, it will ask you :

O: New name:

Type in the name you wish to assign that position. You have 27 characters in which to describe that number. When you have finished typing in the name, press <ENTER>. The left hand portion of the line following the letter you have selected will change to display the name you have just entered, and you will see the next prompt :

O: New number:

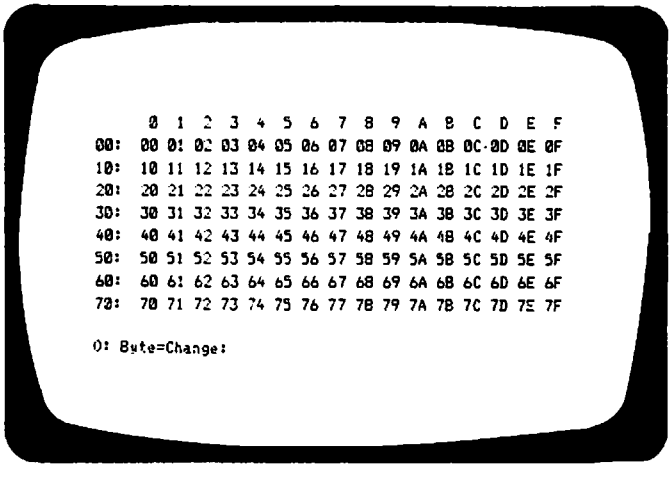
Enter the telephone number you wish to assign to that position. You have 15 characters to detail the number, which is adequate for local, long distance, and even overseas numbers. Remember, MicroTerm ignores all punctuation such as parentheses or dashes between numbers. When you have finished typing in the number, press <ENTER>. The right hand portion of the line following the letter you selected will change to display the number you have just typed in. You will then be returned to the original selection prompt. You may change any or all of the numbers, or simply update them. When you have completed this, you return to the Command Menu by pressing either <BREAK> or <CLEAR>.

For example, if a local BBS changed its number but not its name, select that line by typing in the correct letter, skip the name by pressing <ENTER>, and then type in the new number. The number would change and the name will be left as it was originally.

If for any reason you wish to erase a name or number and not replace it with anything else, press the space bar, then press <ENTER> when it asks you for name or number.

The translation tables

The translation tables all look the same. When you select the table you wish to view, the screen will clear and you will see this:



This shows the first 128 bytes of the table. Notice that there are 8 rows (00-70) of 15 columns (0-F) each. This allows you alter bytes 00-7F in this first portion. To find the current value of any byte, first find the row it is in, then look over to the proper column. For example, byte "1E" is in the row beginning with "10", and is underneath the letter "E".

To see the next 128 bytes, press <ENTER>.

This displays the last 128 bytes of the table. Notice that you have the same 8 rows (now 80-F0) with the same 15 columns (still 0-F). You look up bytes in the same manner. Pressing <ENTER> switches you back and forth between the first and last pages of the table.

In these examples, all bytes are set to their original values; none of them are translated. If this were the keyboard table, all keys would send their standard values. If it were the display or printer table, all values would be transmitted to their respective devices without alteration.

To change a byte, display the portion of the table (first 128 bytes or last 128 bytes) where it is displayed. Then, at the prompt :

O: Byte=Change:

Type in first the byte you wish to alter, then an equal sign (=), followed by the new value you wish. The value will change on the screen. To make it easy for you to tell at a glance which values have been altered, any byte which has been translated into another value will be displayed on the table between bars. The graphic bars will disappear when the byte is restored to its original value.

Study these examples:

An Epson MX-80 printer is set to the expanded mode or double wide print when it receives an ASCII 0EH (14 decimal). Because this is normally undesirable when doing communications work, it can be prevented by selecting the "Change/examine tables" sub-command from the Command Menu by pressing <O>. Then select the printer table by pressing <P>. The following prompt will appear:

O: Byte=Change:

Type 0E=00 and press <ENTER>

The immediate effect is seen on the table itself; the byte displayed at location 0E is encased in bars and and the value of the byte is changed to 00. Whenever MicroTerm would send a 0E to the printer, this table would intercept that and send a 00 (null character) instead. This filters out the undesired code.

To prevent sending the code that would set your TRS-80 screen to the double wide format (32 character line), use the <O> command to "Change/examine tables". Select the display (*DO) by entering <D>. At the prompt:

O: Byte=Change:

Type 17=00 and press <ENTER>

This will effectively filter out the ASCII 17H (23 decimal), thus preventing your screen from being put into the "double-wide" text mode.

Notice that some of the display characters are already filtered out.

The video characters already translated are there for your convenience. Codes that could cause the screen to enter the double-wide mode, or behave erratically in any other manner, were changed to values that prove less troublesome.

Notice that no printer codes have been translated at this time. Because of the growing number of printers on the market, it would not be wise to translate the codes to work with any particular printer. Therefore all codes in the printer table are left at their original value. Study your printer manual to determine what codes you require to operate your printer with the features you desire for communications work, and make note of any codes that could cause potential trouble. You may filter or change any of them that you wish.

Theory of Operation

Let's examine the keyboard table first. There are 128 ASCII characters. Most microcomputers, however, are not equipped with keyboards capable of typing the full ASCII set directly. Therefore, some other method must be used if you need to generate characters that do not appear on your keyboard.

The keyboard translation table allows you to re-define any keyboard generated value into any other value your computer is capable of sending. This allows the control characters and all those special characters, described earlier in this manual, to be typed easily from the standard keyboard.

It also allows you to re-define certain control functions. For example, pressing <Shift> <CLEAR> generates a code of FFH. This switches you back and forth between the Command Mode and the Terminal Mode. If you wanted to locate that function on the S key, all you would have to is change the value of the S key (53H) in the keyboard table to the value of the <Shift> <CLEAR> (FFH). Whenever you pressed S after that, the code FFH would be sent and the program will switch from the Command Mode to the Terminal Mode. While this is a good example, it is very definitely a poor choice of keys. With the S key translated to a value of FFH, it would be impossible to type the letter S unless you assigned the S to some other key.

Next, look at the display table (DO). The purpose of this table is to enable you to translate your output to match your system's functions.. Most computers use a set of control codes to handle the functions of the machine. These codes are assigned values outside the ASCII character set. An example might be the codes to clear the screen.

On a TRS-80, this would be a combination of two codes, a 1CH to home the cursor and a 1FH to clear the screen from the current cursor position to the end of the display. The Apple uses entirely different codes for this. When communicating with an Apple bulletin board, or directly with an Apple owner, you would want to translate whatever clear screen sequence was sent for the Apples into the proper sequence for the TRS-80.

As stated earlier, it can also be used as an advance filter to remove whatever video control codes that would have an undesirable effect on your system.

The printer table (PR) was also covered earlier but is reviewed here. There are two main functions for the printer translation table.

First, it could allow your TRS-80 to use a printer that was configured for some system other than ASCII. For example, a printer that was designed to work with an IBM computer would use EBCDIC. MicroTerm allows youto translate all of your ASCII output to the corresponding EBCDIC codes.

The second feature is one more commonly used. This allows you to custom configure MicroTerm for your particular printer. For example, you may filter out codes that will cause double wide print or codes that will cause boldface or underlined print or any other control codes that might be sent by chance to the printer.

If the service you are using sends you a special character and your printer uses that to perform a totally differenct function than the video, you may use the printer translation table to change it.

For example, CompuServe might send a left bracket, which is ASCII code 5BH. If your printer uses the code 8AH for the left bracket, simply go to the printer translation table and change the code at position 5BH to an 8AH. This would translate the CompuServe code 5BH into the 8AH required by your printer to produce a left bracket.

The four remaining tables (BI, BO, RI, RO) will perform the same function but at the buffer and the RS232C. If you had a file on your disk you desired to send to more than one system, you could translate it when transmitting the contents of the buffer with the BI table or the RO table. Simply remember that the BI stands for "using the Buffer as an Input device," BO stands for "using the Buffer as an Output device." RI and RO have the same meanings for the RS232C.

As you can see, the mechanics of the command are simple and straightforward, yet the command itself can be extremely powerful. By using these tables, you can adapt to almost any hardware you are ever likely to encounter, and you will never have to worry about working a system that is slightly out of the ordinary. You have the ability to alter your MicroTerm to handle such systems with ease.

Once you have configured your system to work with another, you'll never have to change it again, thanks to the ability to store multiple data files for your MicroTerm. After setting the tables to the values needed, you are now ready to save these settings in a separate data file with the next of the commands.

P: Save MicroTerm settings

This command allows you to save the current settings of MicroTerm as a data file. You may either save them as the new default values by saving them into the file MTERM/DAT or you may create a new file containg a set of alternate default values by saving it under a different filename.

As you already know, MicroTerm stores all of its initial settings, translation tables, phone number tables, and all internal system flags in a file on the disk. Every time MicroTerm is loaded, it will load one of these files or returns to DOS. If you simply enter MTERM with no filename following the program name (i.e., MTERM <ENTER>), it will seek to load a file called MTERM/DAT, which is the default file.

If you make changes to MicroTerm and you wish these changes to become part of the default settings, simply save the current MicroTerm settings into the file MTERM/DAT. If these new settings you are using are going to be used often enough to save, but not often enough to become the defaults, then save them with whatever filename you like and you may load them in as the optional default later.

This is a Parameter Command. When you press <P>, the bottom of the Command Menu display area will clear with the exception of the prompt :

P: Filespec:

At this point you may enter the name of the file which will save the current settings of MicroTerm. If you want to save these settings as the permanent defaults, save it with the filename MTERM/DAT. Any standard file specification will do for an optional file.

Once it has saved the information, it will return you to the Command Menu. A byte by byte technical documentation of the save parameter files is included in the Technical Section of this manual.

Q: Load MicroTerm settings

With this command, you can effectively switch settings while in the middle of a session. You may load complete new settings and translation tables, thus changing the program around entirely from the current configuration. One common use of this is to load a different set of MacroKeys.

This is a Parameter Command. When you press <Q> from the Command Menu, the bottom of the display menu will clear with the exception of the prompt :

Q: Filespec:

Now enter the name of the data file that contains the new setting information. MicroTerm will return you to the Command Menu after loading the new settings. You will see immediately what has been done to alter the configuration.

For example, if you use your computer primarily to communicate with CompuServe, then your MTERM/DAT default file would probably be changed to reflect the optimum configuration for CompuServe. Every time you load MicroTerm, you will be configured to communicate with that system. However, if you call The Source fairly regularly as well, you would want a second file on the disk (probably called SOURCE/DAT).

When you want to call The Source, you can load MicroTerm and its Source configuration by entering MTERM SOURCE/DAT from the DOS level. However, if you are already in the program with the CompuServe settings, you can change the settings without exiting MicroTerm by using this command. For example, press <Q>, and the bottom of the Command Menu will clear except for the prompt:

Q: Filespec:

When you enter SOURCE/DAT, MicroTerm will load the new settings from the file SOURCE/DAT. Using this feature, you can have any number of MicroTerm configurations prepared on the disk and change from one to another with a minimum of time and effort.

R: Set RS232 parameters

This command allows you to re-program the UART (<U>niversal <A>synchronous <R>eceiver <T>ransmitter). This, along with the Baud Rate Generator, is the portion of the RS232C that is concerned with the actual transmission of data.

This is a Parameter Command. When you press <R> from the Command Menu, the bottom of the display will clear and you will see a sequence of prompts. First, you will be asked :

R: Baud:

At this point, enter one of the valid baud rates. The baud rate indicates the number of bits per second (bps) the RS232C transmits. For example, a modem communicating at 300 baud is sending and receiving at a rate of 300 bits per second.

Allowable baud rates are : 50, 75, 110, 134, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600, and 19200.

If you wish to leave the baud rate unchanged, just press <ENTER> at this prompt. 300 baud the most common transmission rate in use, and is therefore the default for MicroTerm. The next prompt you will see is:

R: Word:

Here you may set the number of data bits making up a transmitted character. Different applications will require different settings of this parameter. Adjust to whatever is required by the remote system you will be working. The rule here, as always, is that you must adjust to whatever the host computer demands.

Allowable word lengths are : 5, 6, 7, or 8 bit words. To leave the word length unchanged, just press <ENTER> in response to this prompt.

7 and 8 bit words are the most commonly used. You will find that 7 bit is used more often in standard communications, because ASCII is a 7 bit code; data communications (direct file transfer programs and the like) normally use 8 bit. Because 7 bit words are the most common, MicroTerm is set for 7 bits as the default setting. The next question will be :

R: Stops:

This is asking for the number of stop bits you wish to use when transmitting data. Here, too, you will have to adjust your terminal to whatever the host computer uses.

Stop bits may be either 1 or 2. To leave the stop bits unchanged, simply press <ENTER>.

1 is perhaps the most common value, and is therefore the default for MicroTerm. The final query is :

R: Parity:

Here you may indicate whether you wish to use even parity, odd parity, or no parity. Parity is a form of error checking. The parity bit, if it is used, is an extra bit that makes the number of bits that are set in each data word either odd or even. If a bit is lost or somehow changed during transmission, the character will arrive with the count wrong and the error will have been detected.

You may set parity equal to : O, E, or N (odd, even, or none). To leave parity unchanged, simply press <ENTER> at this prompt.

While even parity is perhaps a the most common, the only rule here is to adjust to whatever the other system is using. Even parity is the default value.

When you have finished entering all this information, you will be returned to the Command Menu and the display at the bottom will be changed to reflect your alterations.

S: Save buffer

This command allows you to write the contents of the buffer out as a disk file (or transmit to any other legal device, for that matter). This will be used in storing programs you have downloaded to a disk file, or directing them to the printer for hard copy. You may also save the buffer to any other legal device if you desire.

This is a Parameter Command. When you press <S> from the Command Menu, the bottom of the display will clear with the exception of the prompt :

S: Filespec:

At this point, enter the name of the file you wish to save the buffer into. It should be a standard file specification.

When MicroTerm stores text in the buffer, it does not store VideoTex codes or translated values. If you are using screen re-formatting, however, it will store the text in its re-formatted form.

Your primary use for this command will be to download programs, messages, and/or text files from various communication services, then save the data to disk for later printout, re-transmission, or whatever your needs dictate.

You may also save the buffer to a device. For example, if you want to print the buffer you could choose one of two methods: Use the "View buffer" command, or save the buffer to *PR.

Printing the buffer through the "View buffer" command is the normal method. This allows you to print through the printer translation table and will also recover from being hung up by an off-line printer. This method (save to *PR) offers neither of those advantages.

Just because this feature is in MicroTerm doesn't mean that you must find a way to use it. Device independence is built into DOSPLUS, so MicroTerm takes advantage of it. The power is there if you need it, but for most applications the command designed to handle a particular application will work better. The usual application is to save to a disk file. The following is an example:

S: Filespec: MSGS/TXT <ENTER>

This saves the contents of the buffer into a file named "MSGS/TXT". It can then later be recalled and printed, processed with a full screen text editor, transmitted to another remote station, etc. This use is quite common. A file can be prepared in advance, edited, corrected, added to, and made ready for transmission while off line, and thus not incur charges for on line time. When you are ready to transmit, simply load the file into the buffer with the L command (Load buffer from file). Once the file is loaded into your buffer, you can proceed to the next step:

T: Transmit buffer

This command allows you to transmit the contents of the buffer to a remote computer, and is used primarily for uploading messages, programs or other data which have been prepared while off-line.

This is both a Parameter Command and an Immediate Action Command. When you press <T> from the Command Menu, the bottom of the display area will clear and you will be prompted for the following data:

T: Prompt string (use ";" for C/R):

MicroTerm allows the use of prompted output since most communication services cannot accept a continuous stream of data when receiving. The normal method is to accept one line at a time; when the line has been received, the remote station sends you a prompt when it is ready to receive the next line; MicroTerm transmits until it reaches a carriage return.

If you know the prompt string used, enter it here. This assures you that MicroTerm will not "out-run" the remote computer by transmitting a continuous stream of characters while the receiving computer is storing one line and preparing to receive another. If you are not sure what the prompt is, you can at least expect a carriage return at the end of it. By entering a ";" for a carriage return, MicroTerm will wait for a carriage return before transmitting the next line.

If there is no prompting, or if for any reason you don't need to use prompted output, just press <ENTER>. (An example would be transmitting a long text file that will not need to be formatted for a video screen, but simply stored at the other end as a text file that will later be loaded into a word processor.) Once you enter the prompt string, you will see :

T: Character delay (0-255):

MicroTerm can also transmit data with delayed output if the remote system needs it. This is another way to upload files. Some services will not send a prompt to your computer because they do not process the data a line at a time. As data are received, it is processed byte by byte, and the system needs enough time for processing it.

If the remote system requires delays, it is at this prompt you select the amount of time for the delay. MicroTerm will pause for approximately .25 seconds for each delay before sending the next character. For example, if you entered a delay value of 10, there would be a delay of about two and a half seconds between characters.

This method is seldom used because it is not as effective as prompted transmission and can be excruciatingly slow. You will seldom, if ever, encounter this situation, but the ability to send delays is included with MicroTerm to enable you to transmit data from the buffer under almost any circumstances.

After you answer the character delay prompt, you will be asked :

T: Transmit time (hh.mm.ss):

This option allows you to set up MicroTerm's automatic buffer transmission feature. This feature will allow you to automatically dial the telephone and transmit the buffer when carrier is established without operator intervention.

Normally you will begin transmitting the buffer without delay. Simply press <ENTER>. You will be returned to the Command Menu. From there, press <CLEAR> or <BREAK> and return to the Terminal Mode. When you re-enter the Terminal Mode, the buffer begins transmitting.

Should you desire to use the automatic timed buffer transmission feature, simply enter the time you wish to transmit the buffer. Enter it in the specified format (hh.mm.ss) using periods as delimiters between the figures. Once you have entered the time for transmission, you will be taken to the MicroTerm dialing menu. Select the telephone number you wish to dial the same way you do when placing an immediate call.

MicroTerm will then return you to the Command Menu. You must return manually to the Terminal Mode. You may continue normal terminal operations at this time if you wish. When the system clock reaches the time you have set, MicroTerm will dial the number you have chosen and begin to transmit the buffer.

It is important to remember two things for automatic transmission. First, you must set the system clock to the correct time. To set the current system time, use the "Execute DOS command" function. Select "K" from the main menu, and when it asks you "K: Enter DOS command:", respond with TIME HH:MM:SS <ENTER> (where HH:MM:SS is the current time). Notice that the delimiters here are colons.

(To turn on the clock display, use the same function but type CLOCK (ON) <ENTER> at the prompt. To turn the clock off, type CLOCK (OFF) <ENTER> when it asks you to enter the DOS command.)

The second thing to remember is that you must be in the Terminal Mode for the timed transmission to work. If you leave your machine, make certain it is in the Terminal Mode.

This feature is extremely useful in cases where a number of branch offices or representatives must submit regular reports to a central location. In order to use the most economical telephone rates, each remote station could be assigned a particular time during the night to transmit its report. Prior to leaving the office for the day, the operator would have the report in the buffer and set the system for automatic timed transmission. Thus there would be no need to have an operator on duty to transmit the report, and the central system would be able to receive each report without having several remote stations attempting to log on at the same time.

If the carrier is not established after 30 seconds, MicroTerm will abort and hang up the phone, leaving you in the terminal mode with keyboard control restored. This would occur if the phone is not answered, or something else goes wrong to prevent the establishing of carrier. To abort prior to the end of this delay, press <BREAK>.

The following is an example of the sequence to be followed for immediate transmission of the data in your buffer. We will assume the prompt string for the host system you are connected with is ">" followed by a carriage return. No delay characters are needed. After pressing <T> in the Command Mode, respond to the prompts as follows:

T: Prompt string (use ";" for C/R): >; <ENTER>
T: Character delay (0-255): <ENTER>
T: Transmit time (hh.mm.ss): <ENTER>

You will now be returned to the Command Menu, and you must then enter the Termal Mode in the usual manner, by pressing <CLEAR>. Once in the Terminal Mode, the transmission begins immediately, sending the contents of the buffer, using prompted output. It will wait for a "greater than" sign (>) followed by a carriage return to be received before transmitting each line. There will be no delay between individual characters.

The following is an example of how to respond to the prompts for an automatic timed transmission:

T: Prompt string (use ";" for C/R): >; <ENTER>
T: Character delay (0-255): <ENTER>
T: Transmit time (hh.mm.ss): 01.45.00

When the dialing menu is shown, select the letter that corresponds with the remote system to which you wish to transmit the contents of your buffer, for example "B". You will then be returned to the Command Mode. Press <CLEAR> to enter the Terminal Mode.

Your system will now wait until 01:45:00 (or quarter to two in the morning), connect the phone, and dial the number stored under the letter "B". When the remote phone is answered and the carrier is established, MicroTerm will return to the Terminal Mode and wait. Whenever it receives the prompt character ">", it will transmit another line of the data in the buffer. When the transmission is complete, MicroTerm will hang up the phone.

When entering the command parameters to transmit the buffer, remember that the buffer does not actually begin transmitting until you return to the Terminal Mode.

If for any reason you wish to abort while transmitting, simply return to the Command menu and press <T> again. That will shut off the buffer transmission.

Notes

Two Separate Utility Programs

(XFER/CMD)

Direct File Transfer Program

This program, separate and distinct from MicroTerm, is included with your MicroTerm Communications Package. It provides you with the ability to transfer files directly between two computer stations via MicroTerm without the necessity of converting them to hexadecimal format first. This requires that both systems have XFER or any program that is compatible with XFER. The current version of XFER (version 2.0) is compatible with a program by Bob Withers known as DFT (his version 1.3). Compatibility between later versions of either program is not guaranteed.

The first step is to load XFER. To do this, type XFER at the DOS PLUS prompt and press <ENTER>. The screen will clear and you will see the header:

```
XFER - File transfer utility - 2.0
Copyright (c) 1982, Micro-Systems Software Inc.

*
```

The asterisk is the "XFER command prompt". Remember that term, as we will refer to it later. To see a list of valid XFER commands, type H at the XFER command prompt and press <ENTER>. The display will now read:

```
XFER - File transfer utility - 2.0
Copyright (c) 1982, Micro-Systems Software Inc.

*H
B,C,D,H,Q,R,T
*
```

Those letters represent your valid commands. We will cover each in turn. Briefly, they are:

Letter	Command
B	Display/alter baud rate
C	Enter chat mode
D	Execute DOS command
H	Display help list
Q	Exit the program
R	Receive specified file
T	Transmit specified file

-B-

Display or Alter Baud Rate. This command is used to alter the baud rate used by XFER for receiving or transmitting data. The default rate is 300 baud. Valid baud rates are: 50, 75, 110, 134, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600, and 19200.

To see check the current baud rate, press <B> and <ENTER>. To set a new baud rate, type the number of the rate you desire and press <ENTER>. The new baud rate will be displayed, as in the following examples:

```
*B <ENTER>
BAUD = 00300
```

This example shows how to display the current baud rate. When <B> alone is entered, the baud rate is displayed in the format shown.

If you desire to set the baud rate, you may do so at the time you enter the B command, as follows:

```
*B1200 <ENTER>
```

Your display will now show:

```
BAUD = 1200
*
```

When the information was entered, the program displayed the new baud rate as confirmation of the action.

It is important to remember that whatever baud rate you choose, the XFER (or other similar program) at the remote system must be operating at the same speed.

Please note that while XFER is capable of high baud rates, it cannot communicate with another computer (even if the remote station is capable of the same rates) unless your modem is designed for it. Most modems will work at baud rates up to 300, but not higher. In fact, most of them are limited to 300 baud only. Unless your modem is designed for higher speeds, forget about it.

-C-

Enter Chat Mode. This mode will allow you to converse with the other computer station before beginning file transfer. Once carrier is established, both stations may go into this mode and carry on a two-way conversation to make certain that a good connection is established and both terminals are at the same baud rate.

The Chat Mode of XFER operates in half duplex. Because of this, you will not be aware of bad transmission, since the characters are sent to your video display locally rather than echoed from the remote system. Be certain to ask if your transmission is good.

To enter the Chat Mode, press <C> and <ENTER> at the XFER command prompt. XFER will reply with "Chat on" and the XFER command prompt will disappear. At that point you may simply begin typing.

To exit the Chat Mode, press <BREAK>. XFER will reply with "Chat off" and the XFER command prompt will re-appear.

-D-

Execute DOS command. This option allows you to execute any valid TDOS library command. (If you have transferred MicroTerm to a standard DOSPLUS, you may use any of the library commands except CLEAR. You may use any of the utilities that do not use memory above 56FFH.

The primary use for this command will be to execute the command CAT to check if the file you wish to transfer is on a specific disk or to copy that file from one disk to another. On a regular DOSPLUS, you could also use the "DIR" command to see how large a file is before beginning and you could use the FREE command to make certain that you have enough free space on a diskette to store a file you plan to receive.

To use this command, press <D>, followed by the desired DOS command. When the command is finished, the XFER command prompt will be re-displayed. Here is an example:

*D CAT :1

This example will display a file catalog for the diskette in Drive One.

-H-

Display Help List. This command simply prints the list of all valid commands, in their abbreviated form. It has no parameters and will take no other action. An example of how to use this was provided in the beginning of this section. You simply type an H and press <ENTER> when at the XFER command prompt.

-Q-

Exit the Program. This command is used to return to DOS. When you press <Q> and <ENTER> at the XFER command prompt, you will returned to the "DOS PLUS" prompt.

-R-

Receive File. This command is used when you wish to receive a file from a remote system and store it on your diskette. Before using this command, be sure to set your baud rate and any other parameter changes you desire and verify the connection while in the Chat Mode.

To use this command, press <R>, followed by the name of the file you wish to receive, then press <ENTER>. XFER will open the specified file (if you do not specify a drive number, it will do this on the first available drive) and go into the Receive Mode.

When in the Receive Mode, XFER will display its current status to the immediate right of the command line you just entered. The first thing it will display (however briefly) will be the phrase "Awaiting ACK". This means that it has sent an enquiry (ENQ) to the transmitting end as is waiting to be acknowleged (ACK). This will be re-displayed after each sector is received for as long as it takes the remote station to begin to transmit the next sector. This handshaking is what assures you of no missed sectors during transfer. One computer will not get ahead of the other.

When it is in the process of receiving data, you will see the phrase "Receving sector - nnnnn" (with "nnnnn" indicating the current sector number). When it checks the data received against the verification information sent by the transmitting system, and if it determines that there was an error, it will display the message "Bad sector! Re-transmit", then try again.

If for any reason you want to abort at any time, press <BREAK>. You will get the message "Transmission aborted", which will be repeated at the other end, and you will be returned to the XFER command prompt. Look at this example of how to reeive a file:

*R PROGNAME/CMD:1

When you enter this line, XFER will open the file "Progname/Cmd" on Drive One and send an enquiry (ENQ) in preparation for receiving the file. It will display the status to the right of the command line in this manner:

*R PROGNAME/CMD:1 Awaiting ACK

or

*R PROGNAME/CMD:1 Receiving sector - 00001

At this point you may sit back and enjoy your coffee while MicroTerm and XFER do all the work for you. When the transmission is complete, you will see the message "Received EOF" and/or "Transmission Complete."

-T-

Transmit File. This command is used when you wish to take a file stored on your diskette and transmit it to a remote computer. As with Receive, we suggest that before using this command you first establish contact with the Chat Mode and verify connection and transmission before beginning.

To use this command, press <T> from the XFER command prompt, followed by the name of the file, then press <ENTER>. XFER will search for the file (if you do not specify a drive number, it will do a global search beginning with the first available drive), open it and then enter the Transmit Mode.

Once in the transmit mode, XFER will display its current status to the immediate right of the command line you just entered. The first thing it will display (however briefly) will be the phrase "Awaiting ENQ". This means that it is waiting for an enquiry (ENQ) to be sent from the receiving end. When the ENQ is received, XFER will send an ACK (acknowlege). This will be re-displayed after each sector is received for as long as it takes the remote station to signal that it is ready to receive the next sector. This handshaking is what assures you of no missed sectors during transfer. One computer will not be able to get ahead of the other.

When it is actually transmitting data, XFER will display the phrase "Sending sector - nnnnn" (with nnnnn indicating the current sector number). After each sector, it sends verification information so that the receiving end can check for errors. If the receiving end detects an error, it will signal the transmitting end to send the sector again and you will get the message "Bad sector! Re-transmit" and it will try again. This is all performed without any effort on your part.

If for any reason you wish to abort the operation during a transmission, simply press <BREAK>. You will see the message "Transmission aborted", which will be displayed at the remote station, and you will be returned to the XFER Command prompt. See the following example:

*T PROGNAME/CMD:1

When you enter this line, XFER will open the file "Progname/Cmd" on Drive One and wait for an ENQ from the remote station in preparation for sending the file. It will display the status to the right of the command line like this :

*T PROGNAME/CMD:1 Awaiting ENQ

or

*T PROGNAME/CMD:1 Sending sector - 00001

(FILECONV/CMD)

ASCII/Binary conversion program

This separate program, which is also included as a regular feature of MicroTerm, will allow you to convert a file from binary format on the disk to an ASCII text file of hexadecimal characters in order to transfer them via MicroTerm.

This will be used primarily as a means of converting machine language programs and other files (such as data files) that are not in ASCII format and would otherwise have no means of being transfered except with XFER/CMD. You may convert these files to an ASCII text file (usually called "ASCII Hex"), upload it to a remote computer for later downloading and reconversion to its original form by the station receiving it. Because this is now a standard ASCII text file, it may be manipulated as any other file suitable for transmission. There is no need to use a program such as XFER, which requires operator attention at both ends.

The first step in using the program is to load it while in the DOS level. Type FILECONV and press <ENTER>. The screen will clear and you will see the header :

FILECONV - File conversion utility V1.0
Copyright 1982, by Micro-Systems Software, Inc.

Source Filename :

Now enter the name of the file you wish to convert. When you reply to this question with a standard DOSPLUS file specification, you will be asked:

Destination Filename:

Respond to this with the name you desire on the file after conversion. When you have entered this file specification, you will be prompted for :

Convert to :

Now you enter <B> if you desire the file to be converted from ASCII (or hexadecimal) to Binary, or <H> if you are converting from Binary to Hexadecimal. The answer to this prompt can be either, with no other choices allowed. After answering all these questions, FILECONV will convert the file as ordered and return to the "DOS PLUS" prompt. See these two examples:

```
Source Filename      : Routine/Cmd:1
Destination Filename : Routine/Asc:1
Convert to           : H
```

In this example, we are taking a machine language program called "Routine/Cmd" on Drive One and converting it to an ASCII hex file called "Routine/Asc" to be stored on the same drive. When finished, copies of "Routine/Cmd" and "Routine/Asc" will both be stored on Drive One.

```
Source Filename      : Download/Asc:2
Destination Filename : Download/Cmd:1
Convert to           : B
```

This example accomplishes the opposite result. We begin by taking an ASCII file on Drive Two with the name "Download/Asc" and converting it to a binary file on Drive One called "Download/Cmd". This can now be loaded and executed as any other machine language program.

Technical Notes

When FILECONV creates an ASCII hex file, it creates lines of ASCII text 60 characters long terminated by a carriage return. When it creates a binary file, it does so in standard Z-80 load module format.

The ASCII hex files created by FILECONV are in the same format as used by most other major terminal packages, so transfer of files between MicroTerm and other systems should be possible without any difficulty.

When FILECONV creates a binary file from an ASCII hexadecimal text file, it will ignore anything but valid hexidecimal characters. For example, if there should happen to be a "Q" in the middle of your file, FILECONV simply ignores it and continues to the next valid hexadecimal character. What this means is that if you have somehow received some extraneous "garbage" characters during a download and these are saved with the buffer, the file can be still be reconverted to its binary format. Of course, if that "Q" was supposed to be an "A", the binary file will be glitched when the character is omitted.

You may also use a shorthand format when calling FILECONV from the DOSPLUS prompt. The syntax is:

FILECONV sourcefile destfile (sw)

"sourcefile" is the source file specification.
"destfile" is the destination file specification.
"(sw)" is the "convert to" switch. This is either "B" or "H", as stated previously.

Study this example:

FILECONV Routine/Cmd:1 Routine/Asc:1 (H)

This accomplishes the same thing as the first example shown above. It takes the binary file "Routine/Cmd" on Drive One and creates an ASCII hexadecimal text file called "Routine/Asc" on the same drive.

Introduction

This portion of the MicroTerm documentation is the MicroTerm Technical Manual. It will detail information that the average user of MicroTerm never need concern himself with, but the experienced programmer will want to know.

The manual will cover three areas :

(1) The MTERM/DAT file. Information on the data files that store MTERM data permanently.

(2) ASCII tables. Listings of the complete ASCII character set.

(3) Technical aspects of the program. Things obscure enough that the user shouldn't have to read them, but still worthy of documenting for the more experienced computerist.

While every owner of MicroTerm is allowed to, and certainly encouraged to, read this section, all users will not be able to make use of the information stored here.

Warning : Do not attempt to directly alter the internal structure of the program unless you are competent and aware of exactly what you are doing. We have provided plenty of internal manipulation of the program such that anything you wish to do can be accomplished without having to make potentially disastrous program modifications.

The MTERM/DAT file

When MicroTerm "saves its settings", it saves them into a 12 sector disk file (the filename of which is specified when the program is loaded). If no filename is specified when MTERM loads in, it will load its default settings out of the file MTERM/DAT.

It is important to remember not to rename the MTERM/DAT file. As soon as you do, the default settings will no longer be found upon powerup. Should you not specify a filename for it to load settings out of and should there not be an MTERM/DAT file for it to pull this data from, the system will abort to DOS.

The first sector contains a number of bytes that are either flags or contain stored values pertinent to the system. Items marked with the symbol "*" are for internal system use only. If the MicroTerm settings just happened to be saved at the right moment while these options are engaged, this information would be written to the data file.

This, however, can cause very undesirable results. For example, let's say you're transmitting your buffer. In the middle of transmission you return to the command menu and save the current MicroTerm settings. Bit 6 of Byte 0 would be saved as set (1). The next time you powered up MicroTerm and it loaded from that file, the first thing it would do is begin to transmit the buffer. For reasons like that one, the information marked for internal use only should not be altered directly by the user.

Sector 1 -

Byte 0: Status flags.

Bit	Meaning (when set)
0	Output to printer on
1	Half Duplex
2	LF suppression on
3	CR suppression on
4	Buffer open
5	Re-draw video
6	Transmit buffer on *
7	Upper case only enabled

Byte 1: Status flags.

Bit	Meaning (when set)
0	Prompted output on
1	Send MacroKey
2	Device flag
3	Automatic transmit on *
4	Hang up phone after automatic transmit *
5	XON/XOFF flag
6	MacroKey Flag
7	Reserved

Byte 2: Modem type.

Value	Modem type
00	One
01	Two
02	Three
03	Four

Byte 3: Baud Rate Generator Configuration Code.

This byte stores the standard one-byte BRG send/receive baud rate code. For a detailed explanation of this code, consult your RS232C's owner's manual.

Byte 4: UART Configuration Code.

This byte stores the standard one-byte UART configuration code. For a detailed explanation of this code, consult your RS232C's owner's manual.

Byte 5: Video width.

This byte stores the binary value which indicates the currently set video width. Video width can be anywhere from 1-255 characters. The largest value that you may set from program is 99. You may increase the video width past that value by altering this byte.

Bytes 6 & 7: Character delay count for auto logon.

These two bytes store the running delay counter that controls the pauses when transmitting the auto logon message. If the MicroTerm settings were saved while you happened to be transmitting your auto logon, these two bytes would be saved with the rest of the settings. However, there is no practical use for setting these bytes. They are for internal system use only.

Byte 8: Buffer transmission delay counter.

This byte serves the same purpose as the above two except that it keeps track of the character delay count that you input when transmitting the buffer. The same notation applies here. This byte is for internal systems use only. Because of where it happens to fall in memory, it would be saved if you saved the MicroTerm settings while sending your buffer. It would not, however, do you any good.

Byte 9: Buffer transmission delay value.

This byte stores the value that you input when you select the character delay count prior to transmitting your buffer. Once again, this byte is used internally with MicroTerm only. There is no practical value in your altering this value. Even if you alter this value on the disk, it will still force you to enter the delay value every time you transmit. In other words, this is not any kind of default location. It is simply a byte that the systems uses to keep track of the value entered.

Bytes 10, 11, & 12: Transmit time.

These bytes control the time that MicroTerm will automatically dial the phone and transmit the buffer. If you wished to have MicroTerm call up the same number every night at the same time and transmit its buffer, you can.

Simply set the transmission up entering prompt string, character delay, transmit time, and phone number to dial. Then save your MicroTerm settings. It will become part of the programs default parameters to transmit the buffer whenever the system clock reaches the specified time.

Were you to do this, these three bytes would store the time set. Byte 10 contains the hour set, Byte 11 the minute, and Byte 12 the second.

Byte 13: Phone number selected for auto transmit.

This byte controls which number (if any) you have selected to be dialed at the auto transmit time. If this byte is "00", then no phone number has been selected and the buffer will simply transmit at the set time without dialing.

Otherwise, the byte will contain a value between 1 and 10 (01H and 0AH) to indicate which phone number (A-J) was chosen and will be dialed.

Byte 14: RS232 Modem Status port

This byte holds the port address of the RS232 modem status register. Normally, this value is E8H, but it may be altered to utilize non-standard RS232 interfaces.

Byte 15: RS232 Baud Rate select port

This value is the port address of the RS232 baud rate generator. Changing this value allows the user to configure MTERM to work with non-standard RS232 hardware.

Byte 16: UART Status port

This byte contains the port address of the UART status register.

Byte 17: UART Data port

This byte contains the port address of the UART data register.

Byte 18: Dialing port

This value is the port address used to dial the telephone with pulse-dialing auto-dial modems.

Byte 19: On-hook code

This value is output to the dialing port to place the telephone "on-hook" during pulse dialing.

Byte 20: Off-hook code

This value is output to the dialing port to place the telephone "off-hook" during pulse dialing.

Byte 21: Off-hook UART configuration code

This code is similar to byte 4, except it is used to re-configure the UART while the telephone is in the "off-hook" state.

Byte 22: Flags

Bit	Meaning
0	Reserved
1	Reserved
2	Reserved
3	Reserved
4	Reserved
5	Reserved
6	Reserved
7	Reserved

Bytes 23 to 27: Reserved for future use.

Bytes 28 to Sector 3, byte 155: Auto logon message.

These 640 bytes contain the 10 MacroKeys that you set from the command menu. The 64th character of each MacroKey is reserved for the carriage return. If you wish to edit the MacroKeys, you may do that here.

Sector 3, Bytes 156 to Sector 5, byte 63:
Phone numbers.

These 420 bytes are used for the phone number table. It is stored name first, followed by the number (exactly as it is displayed). All data is in ASCII.

Sector 5 , Bytes 64 to 255:

These 192 bytes are used to store the user-defined BELL figure that is displayed on the CRT when an ASCII BEL charactar is received. The 192 bytes represent a 24 character by 8 line figure.

Sector 6:

This sector is used to store the Keyboard translation table. Each byte (00-FF) is used to indicate the translated value. For example, to manually set the keyboard table to translates a 1FH into a 00, you would locate byte 1F in this sector and change it to a "00".

Sector 7:

This sector is used to store the Display translation table. The same conventions apply to it as do to the keyboard table as documented above.

Sector 8:

This sector contains the Printer translation table. Once again, the same conventions as discussed under the keyboard table apply here.

Sector 9:

This sector contains the BI, or buffer input translation table.

Sector 10:

The BO, or buffer output translation table is stored in this sector

Sector 11:

The RS232 input, RI, translation table is stored in this sector.

Sector 12:

This sector contains the RO, or RS232 output translation table.

The table of ASCII characters

The following table details all of the valid ASCII characters, their hex and decimal values.

Dec	Hex	ASCII	Dec	Hex	ASCII
0	00	NUL	32	20	SPACE
1	01	SOH	33	21	!
2	02	STX	34	22	"
3	03	ETX	35	23	#
4	04	EOT	36	24	$
5	05	ENQ	37	25	%
6	06	ACK	38	26	&
7	07	BEL	39	27	'
8	08	BS	40	28	(
9	09	HT	41	29	)
10	0A	LF	42	2A	*
11	0B	VT	43	2B	+
12	0C	FF	44	2C	,
13	0D	CR	45	2D	-
14	0E	SO	46	2E	.
15	0F	SI	47	2F	/
16	10	DLE	48	30	0
17	11	DC1	49	31	1
18	12	DC2	50	32	2
19	13	DC3	51	33	3
20	14	DC4	52	34	4
21	15	NAK	53	35	5
22	16	SYN	54	36	6
23	17	ETB	55	37	7
24	18	CAN	56	38	8
25	19	EM	57	39	9
26	1A	SUB	58	3A	:
27	1B	ESC	59	3B	;
28	1C	FS	60	3C	<
29	1D	GS	61	3D	=
30	1E	RS	62	3E	>
31	1F	US	63	3F	?

ASCII table (cont.)

Dec	Hex	ASCII	Dec	Hex	ASCII
64	40	@	96	60	
65	41	A	97	61	a
66	42	B	98	62	b
67	43	C	99	63	c
68	44	D	100	64	d
69	45	E	101	65	e
70	46	F	102	66	f
71	47	G	103	67	g
72	48	H	104	68	h
73	49	I	105	69	i
74	4A	J	106	6A	j
75	4B	K	107	6B	k
76	4C	L	108	6C	l
77	4D	M	109	6D	m
78	4E	N	110	6E	n
79	4F	O	111	6F	o
80	50	P	112	70	p
81	51	Q	113	71	q
82	52	R	114	72	r
83	53	S	115	73	s
84	54	T	116	74	t
85	55	U	117	75	u
86	56	V	118	76	v
87	57	W	119	77	w
88	58	X	120	78	x
89	59	Y	121	79	y
90	5A	Z	122	7A	z
91	5B	[	123	7B	{
92	5C	\	124	7C	|
93	5D	]	125	7D	}
94	5E	^	126	7E	~
95	5F	_	127	7F	DEL

The preceding were the true ASCII codes, not necessarily what the TRS-80 uses in all cases. In certain instances, the TRS-80 (like all other computers) changes some of the least used special control characters into something else. Consult your TRS-80 owner's manual for the exact meaning of all the codes.

Special control codes

MicroTerm responds to certain control codes. These control codes affect cursor movement or in some other way cause MicroTerm to take a specific action. They are :

Escape commands -

27 & 65

Cursor up. This is also known as Esc-A. When the escape code (ASCII 27) is followed immediately by an ASCII 65 (the letter "A"), the cursor will move up the screen one line.

27 & 66

Cursor down. This is also known as Esc-B. When the escape code (ASCII 27) is followed immediately by an ASCII 65 (the letter "B"), the cursor will move down the screen one line.

27 & 67

Cursor right. This is also known as Esc-C. When the escape code (ASCII 27) is followed immediately by an ASCII 67 (the letter "C"), the cursor will move one character to the right.

27 & 68

Cursor left. This is also known as Esc-D. When the escape code (ASCII 27) is followed immediately by an ASCII 68 (the letter "D"), the cursor will move one character to the left.

27 & 72

Home cursor. This is also know as Esc-H. When the escape code (ASCII 27) is followed immediately by an ASCII 72 (the lettter "H"), the cursor will move to the upper left hand corner of the screen.

27 & 74

Clear to end of page. This is also known as Esc-J. When the escape code (ASCII 27) is followed immediately by an ASCII 74 (the letter "J"), the screen will clear from the current cursor position to the end of the screen.

27 & 75

Clear to end of line. This is also known as Esc-K. When the escape code (ASCII 27) is followed immediately by an ASCII 75 (the letter "K"), the screen wil be cleared from the current cursor position to the end of the current line.

27 & 106

Clear screen. This is also known as Esc-j. When the escape code (ASCII 27) is followed immediately by an ASCII 106 (the letfer "j"), the screen will clear and the cursor will be moved to the home position in the upper left hand corner of the screen.

27 & 89

Cursor X/Y position. This is also known as Esc-Y. When the escape code (ASCII 27) is followed immediately by an ASCII 89 (the letter "Y") it allows the cursor to move directly to any specifed spot on the screen. Once this command is received, the next two characters received will specify the Y (vertical position) and X (horizontal position) coordinates for the cursor. The should be specified in that order.

MicroTerm takes the ASCII value of these characters, subtracts 32 from them, and moves the cursor to the indicated location. Please note that if either coordinate specifies an improper location, the cursor will move to the last valid position in the specified direction and stop there.

X and Y positions begin with 0,0 in the upper left hand corner and proceed to 127,47 in the lower right hand corner.

Single code commands -

19

Transmit off (XOFF). This command is performed when an ASCII code 19 (Ctl-S) is received. It will cause MicroTerm to pause in its output and await a signal before resuming.

Just as you can use this code to pause other systems when they are transmitting, if the remote computer sends you this code, MicroTerm will pause. Ctl-S is also known as DC3 (Device control 3).

17

Transmit on (XON). This command is executed when an ASCII code 18 (Ctl-Q) is received. It will cause MicroTerm (when it has paused from a Ctl-S) to begin transmitting again.

This command is only effective when used in conjunction with the Ctl-S. It will not cause transmission to start remotely without an XOFF command in effect. Ctl-Q is also known as DC1 (Device control 1).

18

Open buffer. This code (ASCII 18 or Ctl-R), when received, will cause MicroTerm to open its input buffer. This is used by most communications services to open your buffer remotely before downloading a file. If the service you are using does send this code prior to the download, it will not be necessary for you to do it manually first.

After this command is received, if you return to the main menu, you will notice that the status display for the buffer switch indicates "Open". You may close it manually, if you wish.

When this code is received, the message "*** Buffer open ***" is displayed. Be careful not to enter anything on the keyboard when downloading a file inasmuch as these extra characters will also be stored in the buffer. Pressing <CLEAR> to go to the command menu will not store any such character, however. This code is also known as DC2 (Device control 2).

20

Close buffer. This code (ASCII 20 or Ctl-T), when received, will cause MicroTerm to close its buffer. Again, as with the Ctl-R (open buffer), most communication services will send this automatically when the download is complete so that you do not have to close the buffer manually.

Once this code has been received, the buffer is closed and if you return to the command menu the buffer status switch will reflect this.

When this code is received, the message "*** Buffer closed ***" will be displayed. You may then save the buffer to a disk file at your leisure. This command is also known as DC4 (Device control 4).

12

Clear screen. This code (ASCII 12) is the command for form feed. Some computer systems expect you to clear your video screen when this code is received and so to remain compatible, this has been included.

This code, when received, functions the same as an Esc-j. It causes the screen to clear and the cursor to be homed. It can be filtered out via the display translation table.

Finally -

With the exception of the Form feed (ASCII 12) code, none of the above described functions may be filtered out or changed. They will always be in effect.

All standard TRS-80 video control codes and cursor motion commands will work as documented in your TRS-80 owner's manual.

And finally, trivia

As you know, MicroTerm allows you to return to the command menu and continue to accept input from the RS232. When you return to the terminal mode, this input is the displayed on the screen until you are current with the incoming data.

This operates by means of an "overflow" buffer. When this buffer becomes full, you begin to lose characters. We have calculated the amount of time that you may spend in the command menu.

At 300 baud : 27 seconds. This figure may change slightly depending on the word length, parity, and the number of stop bits.

At 1200 baud : 6 seconds. As above, this may alter slightly.

Above 1200 baud, don't worry about it. By the time you just get into the command menu, the buffer will be full. Remain in the terminal mode as pause output if you need to go to menu.

Most services operating at more than 300 baud will never send you more than a screen-full of data without pausing with some sort of prompt to continue, so you should be fine.

TDOS -

TDOS is a "limited" operating system, and it has an abbreviated command library. A short description of each command follows.

Nomenclature -

The following conventions are observed in this TDOS manual:

Term	Meaning
:d	Drivespec
:sd	Source drivespec.
:dd	Destination drivespec
filespec	A valid TDOS filename/ext.password:d

AUTO

AUTO command

The AUTO command allows the user to instruct TDOS to automatically execute some pre-determined library command or object file upon system boot-up.

Ex.: If it were desired that TDOS display a file catalog each time TDOS was "booted" in the TRS-80, the following command would be issued:

AUTO CAT

The current AUTO setting may be defeated, or "turned off" by simply typing AUTO and pressing <ENTER>.

Note that the AUTO command writes information to the TDOS diskette. If you wish to set AUTO, the TDOS diskette must not be write-protected.

BREAK

BREAK (ON)
BREAK (OFF)

This command enables or disables the TRS-80's <BREAK> key. When BREAK (OFF) is executed, the <BREAK> key will have no effect. To restore the <BREAK> key to its normal function, the BREAK (ON) command should be issued.

CAT

CAT :d (I,P,T)

The CAT command displays a listing of a diskette's file catalog. The CAT command has several parameters:

(I) Invisible files. When this parameter is used, "invisible" files are displayed as well as visible files.

(P) The P parameter causes the catalog listing to be printed on the system printer.

(T) The "T" parameter allows TDOS to display a file catalog of a Model III TRSDOS diskette. (Model III only)

Several parameters may be used as a part of a single command, as long as the parameters are separated by commas ",".

In order to display a file catalog for any specific disk drive, the user must include the "drivespec", or drive number as part of the CAT command.

Ex.: To display a file catalog (including invisible files) of a diskette in drive 1, the proper command would be:

CAT :1 (I)

CONFIG

CONFIG :d (STEP=xx)

The CONFIG command allows the user to set the "step rate" for each disk drive in the system. The allowable stepping rates are 30 (40 on the Model I), 20, 12, and 6 milliseconds. TDOS is normally configured for the slowest stepping rate in order to accomodate any disk drive. If your drive can "step" faster, you may use the CONFIG command to change the drive's step rate.

COPY

COPY filespec:sd :dd
COPY filespec1:sd filespec2:dd

The COPY command will make a duplicate, or a copy, of a disk file. The new file may exist on the same or a different disk drive then the source file. If the file exists on a different drive, the new file may even bear the same filespec as the source file. There are two permissible forms of this command, as shown above. The first form is a "shorthand" form. Using this shorthand form, a file may be copied from one drive onto another, using the name of the source filespec. If the file is to be copied using another name, the second form of COPY should be used.

DO

DO filespec

The DO command allows the contents of a text file to act as a "substitute" for user keyboard input. For instance, if the file "STARTUP/BLD" contained the following text:

```
CAT :1
BREAK (OFF)
BASIC
RUN"TESTPGM"
```

the DO command "DO STARTUP" would result in DOSPLUS performing a CATalog on drive 1, disabling the BREAK key, entering BASIC, and running the program "TESTPGM". The "DO" command assumes an extension of /BLD unless otherwise specified in the filespec.

KILL

KILL filespec

KILL is used to delete a file from the diskette directory and to free the diskette space occupied by the file. If a file is password protected, the password must be supplied in order for KILL to function.

PAUSE

PAUSE comment text

The PAUSE command is usually used with the DO command. When the PAUSE command is encountered in a DO file, execution of the DO command is suspended until the user presses the <ENTER> key. An optional comment may follow the PAUSE command, for instance:

PAUSE Insert diskette into drive 0

would cause execution of a DO file to stop, and the message "Insert diskette into drive 0" would be printed on the screen.

RENAME

RENAME filespec1 filespec2

The RENAME command allows the user to change a file's filespec. For instance:

RENAME PAYROLL/DAT PAYDAT/APR

would change the name of the file "PAYROLL/DAT" to "PAYDAT/APR". If a file is password protected, the password must be provided in order for RENAME to function.

VERIFY

VERIFY (ON)
VERIFY (OFF)

The VERIFY command enables or disables automatic write verification. When dealing with very important data, it may be desirable for TDOS to verify the correctness of each diskette write. For such sensitive applications, turn VERIFY (ON). For normal operation, VERIFY is left off.

TDOS Utility Programs -

TDOS is provided with several utility programs:

BACKUP	
FORMAT	
COPY1	
CONVERT	(Model III only)
TBASIC	(Standard TDOS)
BASIC	(Extended TDOS)

Each utility is explained in the paragraphs that follow.

BACKUP

```
BACKUP
BACKUP :sd
BACKUP :sd :dd
```

BACKUP is used to make duplicates of TDOS diskettes. BACKUP may be used in single- or multi-drive systems, although different procedures are used. The "source" and/or "destination" drivespecs may be specified on the command line, as shown above, or they may be omitted and BACKUP will prompt for te necessary information.

Single-drive BACKUP

The following steps are used to create a BACKUP diskette using a single-drive system:

(1) From the TDOS command level, type: BACKUP and press <ENTER>.

(2) Place the source diskette in drive 0. The computer will query:

"Source Drive?"

Type "0" and press <ENTER>.

(3) Now the message:

"Destination Drive?"

is displayed on the screen. Type "0" and press <ENTER>.

(4) If the system date has not been set, BACKUP will now ask:

"Backup date (MM/DD/YY):"

Enter the date in MM/DD/YY format (2 digits for the month, 2 digits for the day, and 2 digits for the year) and press <ENTER>.

(5) Now the computer will flash the message:

"Insert Source disk (ENTER)"

on the screen. Place the source diskette (the one you wish to copy) in drive 0, and press <ENTER>.

(6) After a moment, the computer will flash:

"Insert Destination Disk (ENTER)"

on the screen. Remove the source diskette from drive 0 and replace it with the destination diskette (the diskette onto which you wish to copy), and press <ENTER>.

(7) If the destination diskette has been previously formatted, BACKUP will print the message:

"Diskette contains data. Use or not?"

on the screen. If you do not wish to use the diskette, type "N" and press <ENTER>. This will abort the BACKUP, and you may remove the destination diskette from the drive.

If you do wish to use the diskette to make a BACKUP, type "Y" and press <ENTER>. You may also force TDOS to re-format the diskette by typing "F" and pressing <ENTER>.

BACKUP will now format the diskette if necessary.

(8) BACKUP will now alternatively prompt you to insert the source and destination diskettes. As it does, insert the proper diskette into drive 0 and press the <ENTER> key. When then BACKUP is complete, the message:

"Insert SYSTEM disk (ENTER)"

will be flashed on the screen. You may now remove the destination diskette from drive 0, replace it with a TDOS system diskette and press <ENTER>.

Multiple-drive BACKUP -

Use the following procedure to BACKUP a diskette on a multi-drive system:

(1) From the TDOS command level, type: BACKUP

(2) The computer will query:

"Source Drive?"

Place the source diskette in any drive. Type the number of the drive containing the source diskette, and press <ENTER>.

(3) Place a blank (or previously formatted) diskette in another disk drive. Now the message:

"Destination Drive?"

is displayed on the screen. Type the number of the drive containing the destination diskette, and press <ENTER>.

(4) If the system date has not been set, BACKUP will now ask:

"Backup date (MM/DD/YY):"

Enter the date in MM/DD/YY format (2 digits for the month, 2 digits for the day, and 2 digits for the year) and press <ENTER>.

(5) If the destination diskette has been previously formatted, BACKUP will print the message:

"Diskette contains data. Use or not?"

on the screen. If you do not wish to use the diskette, type "N" and press <ENTER>. This will abort the BACKUP, and you may remove the destination diskette from the drive.

If you do wish to use the diskette to make a BACKUP, type "Y" and press <ENTER>. You may also force TDOS to re-format the diskette by typing "F" and pressing <ENTER>.

BACKUP will now format the diskette if necessary.

(6) The computer will now copy the contents of the source diskette onto the destination diskette. When the BACKUP is complete, the message:

"Insert SYSTEM disk (ENTER)"

will be flashed on the screen. You may now remove the source and destination diskettes, place a TDOS system diskette in drive 0 (if there's not already a system disk in drive 0), and press <ENTER>.

FORMAT -

FORMAT
FORMAT :d

The FORMAT utility is used to "format" blank diskettes in order to prepare them for use under TDOS, or to "re-format" previously formatted diskettes (formatting erases all data and program files on the diskette).

To format a diskette under TDOS, do the following:

(1) From the TDOS command level, type:

FORMAT <ENTER>

(2) FORMAT will prompt you:

"Which drive is to be used?"

Place a diskette in any drive (you may remove the system disk from drive 0 if necessary), type the number of the drive, and press <ENTER>.

(3) If the system date has not been set, FORMAT will ask you:

"Format date (MM/DD/YY)?"

Enter the date in MM/DD/YY format (that is, use 2 digits for the month, 2 digits for the day, and 2 digits for the year) and press <ENTER>.

(4) Now FORMAT will prompt with:

"Password?"

You should now enter the "Master Password" for this diskette. If you use DOSPLUS in conjunction with TDOS, you may use the master password to set or reset the passwords for all user files. The master password may be from 1 to 8 characters in length, or you may disregard the question by pressing <ENTER>.

(5) The next question is:

"Number of cylinders (35-96)?"

Enter the number of cylinders (tracks) which you would like to format. On the Model I, 35 tracks is standard. On the Model III, 40 tracks is the norm. If you have drives that are capable of reading and writing more tracks, you may enter the appropriate cylinder count. If you press <ENTER>, FORMAT will assume 40 cylinders.

(6) (For Model III TDOS only)
The final question is:

"Single or double density?"

Answer this question with a "S" (for single-density) or a "D" (for double density). Model III diskettes are normally formatted in double-density, and pressing <ENTER> will make FORMAT default to double-density. For special purposes, you may format single density diskettes by answering "S".

(7) If the diskette previously contained data, FORMAT will inform you:

"Diskette contains data. Use or not?"

If you do not wish to format the diskette, type "N" and press <ENTER> to abort the format. If you do wish to format the diskette, type "Y" and press <ENTER>.

The computer will spend several moments formatting the diskette. When it is finished, the computer will flash the message:

"Insert SYSTEM disk (ENTER)"

on the screen. Remove the newly formatted diskette, make sure that a TDOS system diskette is in drive 0, and press <ENTER>.

COPY1

COPY1 filespec

COPY1 is a utility that allows single-drive users to copy files between diskettes. When using COPY1 to move files from one diskette to another, the program will prompt you for System, Source, and Destination diskettes. Be very careful to insert the proper diskette at the proper time.

CONVERT

CONVERT :d
CONVERT wildcard:sd :dd (param)

CONVERT is a utility supplied on Model III TDOS that allows the user to read files stored on either Model I TRSDOS 2.3 compatible media, or Model III TRSDOS 1.1, 1.2, or 1.3 compatible media.

CONVERT has two basic forms:

(1) CONVERT :d

This form is used to render Model I single-density diskettes readable under Model III TDOS. The single-density diskette should be placed in any drive and the command "CONVERT :d" (where ":d" is the drivespec for the drive holding the diskette to be converted) is typed. After a moment, the DOS READY prompt will be displayed on the screen. The single-density diskette is now readable by Model III TDOS.

(2) CONVERT wildcard:sd :dd (param)

This form is used to copy files from Model III TRSDOS diskettes. The user may specify an optional "wildcard" mask. For instance, the command:

CONVERT GL:1 :0

would cause all files that start with the letters "GL" to be converted from drive 1 onto drive 0.

When converting from Model III TRSDOS version 1.3, the parameter (V13) must be specified in order for a proper conversion to take place. For example, to convert all of the files from a Model III TRSDOS 1.3 in drive 1 onto a TDOS diskette in drive 2, issue the command:

CONVERT :1 :0 (V13)

BASIC & TBASIC

Standard TDOS contains the TBASIC disk BASIC interpreter. Extended TDOS contains the Extended Z80 Disk BASIC interpreter. This TDOS manual will only cover the proper syntax for entering BASIC, allocating file areas, and reserving high memory. For more detailed information on Extended BASIC and TBASIC, consult the DOSPLUS user's manual.

The general syntax for entering the BASIC interpreter is as follows:

BASIC filespec-F:xx-M:yyyyy
or
TBASIC filespec-F:xx-M:yyyyy

The filespec is an optional BASIC program filename to be loaded and executed automatically upon entry to BASIC.

The "-F:xx" is an optional switch that allows the user to specify the number of file buffers desired. BASIC and TBASIC default to 0 files, therefore, if a program requires the use of disk files, this parameter must be used. Any number of files from 1 to 15 are valid.

The "-M:yyyyy" switch is used to protect a portion of RAM from BASIC's use. If the user has data or programs stored in high memory that BASIC should not disturb, this parameter should be used. For example, if a program used a special machine-language input routine that resides in high memory starting from 62762 to 65535 decimal, BASIC should be entered using the following syntax:

```
BASIC -M:62761
```

Notice that the address given is below the first address to be protected.

SIX

GLOSSARY

ACK

Acknowledgment. A signal sent from one system to another to acknowledge that it is ready to begin transmission. See ENQ, Handshaking, NAK.

Acoustic Coupler

A device used with a standard telephone handset to convert digital signals output by the computer via the RS232C interface into acoustic frequencies for transmission over standard telephone lines. On the receiving end, the acoustic coupler converts acoustic frequencies into data signals for input to the computer via the RS232C interface.

Answer Mode

The condition of being ready to receive incoming data.

ASCII

American Standard Code for Information Interchange. (Pronounced "Askey.") The full set consists of 96 printable characters and 32 control characters (non-printable).

Asynchronous

Lacking regular time relationship. As applied to terminal communications, asynchronous refers to the method of transmitting data. It is not necessary for a steady stream of data to be transmitted at regular time intervals between each group of bits. Asynchronous data communications rely on the system's ability to detect the beginning of a group by a change in frequency. See FSK.

Auto Linefeed

A linefeed that is automatically appended to a carriage return, placing the cursor at the beginning of the next line, thus avoiding the overtyping of existing characters.

Backup

An identical copy of a diskette, made as insurance against loss of important data.

Baud or Baud Rate

Transmission speed measured in terms of the number of frequency changes per second. The most common baud rates are 110, 300, 1200, and 4800, with some equipment working at 9600. A typical pattern for data transmission is 1 start bit, 1 stop bit, and 7 data bits to make up a word. Therefore, at 300 baud, approximately 33 characters are transmitted per second.

BBS

Bulletin Board System. A program operating on a host computer, providing a base for Electronic Mail and public information exchange.

Bell 103A

Modem specifications provided by Bell Systems which provide for two narrow bands of frequencies, each of which sends messages in one direction only. Two channels are thus available over one telephone line by means of FSK modulation (see FSK).

Bit

A binary digit, the smallest piece of information recognized by a computer. The two digits are 0 and 1, which represent states of OFF and ON, or LOW and HIGH.

Boot

To get a program ready to run from a cold start of the machine. Startup.

b.p.s.

Bits per second. The baud rate is calculated in the number of bits it transmits each second. Thus, 1200 baud indicates 1200 bits are being transmitted each second.

Buffer

A temporary storage area in memory to hold data, usually for input or output. MicroTerm refers to the buffer as a "Capture Buffer," and this is used to manipulate data. For example, the Capture Buffer can be loaded from a disk file, then routed to the screen or the printer. The data in the Capture Buffer can also be transmitted via the RS232C and the modem to another computer.

Carriage Return or CR

A signal that sends the VDT cursor back to the beginning of the line, or the print head to the beginning of the line it is printing. In most systems, this signal is coupled with a linefeed (LF) to prevent overtyping the existing text.

Carrier

A signal composed of mixed frequency and amplitude. The modem modulates the tones according to the signals sent from the computer to the telephone, and demodulates incoming signals from the telephone to the computer.

Character Set

The total of the different characters that are capable of being transmitted, received or displayed on the screen. In addition to the printable characters, MicroTerm recognizes non-printable control characters. Any special characters available on the TRS-80 can be used by changing the Keyboard Translation Table.

Connect time

Total time spent on host system, measured from signon to signoff, or logon to logoff. Timesharing systems such as Micronet, Dow Jones and CompuServe calculate charges based on connect time.

CPS

Characters per second.

Code conversion

Changing of codes from binary to ASCII, or from ASCII to binary. This is easily accomplished with the MicroTerm FILECONV program.

Control character, Control key

A character or code generated by pressing a key while holding down the control key (Down Arrow). This results in a different code being generated than usually associated with the key pressed. With MicroTerm, two different control keys are used: The Down Arrow functions as the usual control key, while Shift Down Arrow (the normal TRS-80 control key) is used to activate the MacroKeys (0 through 9).

CRT

Cathode Ray Tube; the video screen used to display the characters being transmitted and received. Also called VDT (Video Display Terminal) and screen.

Cursor

The marker on the display indicating the current entry position for the next character.

Data bit

A bit representing part of the actual character being transmitted. Parity, start and stop bits are added before and after the data bits.

Data Communication
The technology of transmitting data between computers, often with one host computer and numerous remote terminals, frequently between two microcomputers. Signals are transferred by hard-wire connections, telephone lines, or satellites.

Default
A value supplied by the system in the absence of operator-supplied values.

Demodulator
The function of a modem which converts incoming signals composed of mixed frequencies and amplitudes to the original digital signals sent by the other computer.

DOS
Disk Operating System, customarily referred to as DOS. The software containing the instructions for making the hardware of a computer function in a particular manner.

Duplex
See Full Duplex, Half Duplex.

EBCDIC
IBM's Extended Binary Coded Decimal Interchange Code (pronounced "Ebsidik"). Using eight-bit codes rather than the seven-bit codes of ASCII, EBCDIC was developed for the IBM 360 computer, and can provide for 256 characters.

Electronic Mail

Messages from one computer to another, stored temporarily as a file in a third computer. Electronic Mail is rapidly becoming popular on BBS's as a means of circumventing the inefficiencies of the postal service.

ENQ

A signal sent to the transmitting computer to indicate that the receiver is ready to receive another sector of data. The ACK signal is the response by the transmitting computer. This series of signals is known as handshaking, and is a method of preventing one computer from getting ahead of the other.

EOF

End of File. A signal indicating that the file being transmitted has reached the end. The receiving computer then sends the remote station an acknowledgment that is has received the end of the file.

File

A group of codes. Text files are ACSII codes representing printable characters, grouped by words, sentences, etc., making them useful for communications between people. BASIC or binary files are used by computers to execute a set of instructions. All types are also known as data files.

Filespec or Filename

The identifying series of up to eight characters (with optional extensions of three characters) given to a block of data.

Firmware

Programs or instructions that have been stored in ROM; software in hardware form, as opposed to software on magnetic media (diskettes). See Hardware, Software.

Format

(1) The process by which a blank diskette is prepared to receive data. Formatting sets up the tracks and sectors to be used. (2) The layout of information on the screen. Screen formatting can be altered easily from the MicroTerm Command menu. (3) The grouping of bits that make up a signal transmitted via modem. Normal formats are 5, 6, 7, and 8 bit words.

FSK

Frequency Shift Keying. A form of frequency modulation which shifts the signals output by the RS232C interface between two predetermined frequencies, rather than simple ON and OFF states. The term originated with the radioteletypewriter method of transmitting data (RTTY).

Full Duplex

A communication mode which permits transmission of data in two directions simultaneously over the same line. In full duplex mode, characters are sent to the remote computer, which echos back to the sender what was received; this echo is then displayed on the screen. Simultaneous transmission is accomplished by utilizing two narrow frequency bands of the carrier.

Function Key

A control key. MicroTerm makes use of the TRS-80's <Shift> <Down Arrow> as a function key to transmit the MacroKeys. See Control codes, control keys.

Half Duplex

A communication mode that can carry transmission of data in either direction, but limits it to one direction at any given moment. In half duplex, all characters entered at the keyboard are sent directly to the display as well as to the modem.

Glitch

Unwanted and annoying defects in a program or in a data file. Usually caused by the reversing of one or more bits, or a dropout of one or more bits.

Handshaking

A system of signals sent and received between two terminals, assuring that each one is working in harmony with the other. See ACK, ENQ, and NAK.

Hardcopy

Paper printout of a file or transmission. With MicroTerm you are able to produce hardcopy of a single message or the entire session while working a distant system.

Hardware

Mechanical, electrical, electronic, or magnetic devices. The physical components of a system, as opposed to the software, or instructions given to the system. See Software, Firmware.

Hexadecimal or Hex

Base 16 number system. Because there are no numerals higher than 9, hexadecimal uses the letters A through F as symbols for the numbers 10 through 15.

HIMEM Ptr

A feature of the machine language program indicating the upper limit of user-available memory.

Intelligent Terminal

A combination of hardware and software which permits sending and receiving data while connected to a remote computer. Capabilities include (but are not limited to) editing, verification of data, remote data entry, and user-programmable functions. MicroTerm and TRS-80 combine to form a highly intelligent terminal.

Interface

A device which provides a means of connecting the computer to some outside device, thus allowing communication between the computer and another device. Examples are the RS232C Interface and the Cassette Interface.

Logon, Logoff

Making connection with the host computer is known as logging on, and the time at which the host recognizes the remote terminal is known as the logon time. Charges are billed based on the actual connect time between logon and logoff, when the connection is terminated.

Linefeed or LF

A signal that moves the cursor down one line on the VDT, or advances the paper one line on a printer. Most systems use Control J for this function.

MacroKey

A user-defined key capable of storing up to 62 keystrokes. After being programmed, they are invoked by holding down the Function Key <Shift> <Down Arrow> and pressing any of the numeral keys. Programming and using MacroKeys is fully explained in Section III of this manual.

Menu

A table of choices or options from which the operator may select.

Mode

The manner in which something is done, or the method used. The MicroTerm program has two separate modes, the Terminal Mode, in which the actual communicating is done, and the Command Mode, in which various functions are performed, such as such as loading the buffer or changing baud rates.

Modem

A peripheral device to interface a computer to a telephone line. The modem (an abbreviation for MOdulate/DEModulate) converts digital signals to analog signals (modulates) for transmission over telephone lines, and converts analog signals to digital (demodulates) for input to the computer.

NAK

Negative acknowledgment. A signal sent to the remote computer indicating that the transmitting computer is not yet ready to transmit. This is the opposite of ENQ. See ACK, ENQ, Handshaking.

Null

A dummy signal used to fill time or space. This is usually 00H.

Originate Mode

One of two pairs of frequencies used for sending and receiving data communications. In the originate mode, the modem transmits a 2025 Hz tone to represent a 0, and a 2225 Hz tone to represent a 1. It receives signals at 1070 Hz representing a 0, and 1270 hz for a 1. These frequencies are reversed in the answer mode.

Parameter

Limits or boundaries, required by the system to be adhered to when entering information, setting baud rates, etc.

Parity

The sum of bits in a character. If the sum is always even, then even parity is said to be even; if the sum is odd, then parity is odd. If no distinction is to be made between even or odd sums, parity is none.

Parity bit

A bit transmitted at the end of a character, and used by the receiving computer to assist in determining whether or not an accurate transmission was received.

Peripheral

Any device connected to the computer and dependent on the computer for its operational instructions, such as a printer or a modem.

RS232C

A standard devised by the Electronic Industries Association for interfacing terminals and modems. The standard specifies the connections carrying data signals, control signals, time duration, voltage levels and current. With minor differences in terminology, the AIE RS232C is identical with the international standard known as CCITT V24. The acceptance of these standards makes possible data communications almost anywhere in the world.

Sector

A physical section of a disk, containing a group of bits. When using XFER/CMD, data is transferred one sector at a time.

Serial Interface

The connection which permits data transmission serially, or sequentially, carrying one bit at a time, as opposed to a parallel interface, which transmits groups of bits simultaneously over several lines.

Software

Programs, codes, routines, or other information written for use with a computer; the information which instructs the computer to do something. See Hardware, Firmware.

Spooling

The capability of storing data in a special buffer to allow the printer to operate at its own speed. Because most printers operate at a slower rate than data are received, this feature of MicroTerm allows you to continue working with a remote station without waiting for the printer to catch up or lose data.

Start Bit

The bit transmitted immediately prior to the group of data bits to assist in synchronization and verification of the data. Most systems utilize zeros for start bits.

Stop Bit

The bit transmitted immediately after the group of data bits to assist in synchronization and verification of the data.

Terminal

Any device connected to a communications line (usually a computer) to send and/or receive signals from a remote computer. A dumb terminal is capable of sending and receiving, but has no programmable capabilities, and no ability to store data. (See Intelligent Terminal.)

Timesharing Computer

A host computer which is accessible from a number of remote terminals, each of which makes use of various aspects of the host intermittently. Because the speed of large systems is so great that it spends most of its time waiting for instructions from the remote terminals, the operators at the remote terminals are seldom aware they are not the only ones using the host.

Transfer of Files

Transmission of text or data files from one computer to another. With MicroTerm this is easily accomplished by loading the desired file into the buffer, then using the T command.

Transmission Frequency

When communicating over telephone lines, the two narrow bands within the analog carrier which provide the means for data transmission. One modem (set in the originate mode) uses the frequencies of 2225 Hz. for a 1 (ON) and 2025 Hz. for a 0 (OFF) to transmit, and receives at 1270 and 1070 Hz. The other modem (in the answer mode), uses the opposite frequencies, thus making simultaneous two-way transmission possible.

UART

Abbreviation for Universal Asynchronous Receiver Transmitter. Peripherals which adhere to the RS232C standards as established by the Electronic Industries Association, are known as UARTs when used for data communications.

User Programmable Key

A feature available in MicroTerm which allows the user to define the output of any particular key at will. This makes possible the transmission of codes which are not available on the keyboard, and unprintable codes.

VDT

Video Display Terminal. See Terminal, CRT.

PORT/BAS

MicroTerm 1.4 contains a small BASIC program called PORT/BAS. This program is used to modify MicroTerm's default settings for the RS232 port addresses and auto-dial information. This program may be used if your RS232 interface uses non-standard port addresses, or if your pulse-dialing modem does not use the RTS line to dial the telephone.

To run the program, enter BASIC from the DOS command level by typing:

BASIC PORT/BAS-F:1

The program will begin to execute, and it will require seven pieces of information.

MicroTerm - RS232 port address setup
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MicroTerm data file :

Modem Status Register :
BRG Register :
UART Status Register :
Rx/Tx Data Regsiter :
Dial Control Register :
On-Hook Control Code :
Off-Hook Control Code :

The first item, MicroTerm data file, refers to the name of the MicroTerm configuration file that you wish to modify. This may be MTERM/DAT, or any other MicroTerm file that you have created. Enter the name of the file and press <ENTER>.

The next four items refer to the I/O ports used by your RS232 interface device. Some RS232 interfaces allow the user to specify a "base port" at which the RS232 port addresses start. The standard port addresses are listed below; Consult your RS232 manual for your particular values.

Modem Status Register	E8H
Baud Rate Generator	E9H
UART Status Register	EAH
UART Data Register	EBH

The next item, dial control register, is used to determine the port address to be used to dial the telephone. The default value is EAH, the UART status register address. Consult your modem manual for the proper value for your modem.

The last two items, On-hook and Off-hook codes, are values that are output to the dial control port in order to place the telephone "on-hook" or "off-hook". The default values are A4H and A5H. For use with the Lynx modem, use 0 and 2.